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Vol. 1133 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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December 3, 1991

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

December 3, 1991 Volume 1133 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1126 O.G. 2, on May 7, 1991.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987 and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was changed on July 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the German mark, and was announced in the *Official Gazette* at 1126 O. G. 76 on May 28, 1991.

International fees were changed on August 1, 1991, due to a difference in the exchange rate of the U.S. dollar in relation to the Swiss franc, and were announced in the *Official Gazette* at 1128 O.G. 46, on July 23, 1991.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1320.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	490.00
Basic Supplemental fee (for each page over 30)	10.00
Designation fee per country or region for the first 10 national or regional offices	119.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	150.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

June 27, 1991

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on November 29, 1988 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,787,099 through 4,788,721
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on November 27, 1984 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,484,359 through 4,485,488
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), and (f), as amended Nov. 5, 1990, which are reproduced below:

37 CFR § 1.20 Post-issuance fees and surcharges

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$415.00
By other than a small entity.....$830.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$835.00
By other than a small enttity.....$1670.00"

The amounts of the surcharges for paying the maintenance fee during the grace period or after the expiration of the patent are set forth in 37 CFR 1.20(k), (l) and (m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED SEPTEMBER 22, 1991 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,404,687	06/438,963	9/20/83
4,404,688	06/345,216	9/20/83
4,404,694	06/359,508	9/20/83
4,404,702	06/239,345	9/20/83
4,404,707	06/266,589	9/20/83
4,404,708	06/374,422	9/20/83
4,404,713	06/327,887	9/20/83
4,404,723	06/261,936	9/20/83
4,404,728	06/257,410	9/20/83
4,404,729	06/319,918	9/20/83
4,404,730	06/349,376	9/20/83
4,404,736	06/319,411	9/20/83
4,404,739	06/351,174	9/20/83
4,404,750	06/242,637	9/20/83
4,404,754	06/319,114	9/20/83
4,404,758	06/341,788	9/20/83
4,404,767	06/317,784	9/20/83
4,404,768	06/266,296	9/20/83
4,404,769	06/220,813	9/20/83
4,404,773	06/259,840	9/20/83
4,404,779	06/254,880	9/20/83
4,404,780	06/244,208	9/20/83
4,404,785	06/228,704	9/20/83
4,404,787	06/236,332	9/20/83
4,404,789	06/291,246	9/20/83
4,404,790	06/272,477	9/20/83
4,404,803	06/244,950	9/20/83
4,404,805	06/244,624	9/20/83
4,404,806	06/299,630	9/20/83
4,404,812	06/325,617	9/20/83
4,404,829	06/315,713	9/20/83
4,404,830	06/362,503	9/20/83
4,404,831	06/283,004	9/20/83
4,404,838	06/286,086	9/20/83
4,404,844	06/341,854	9/20/83
4,404,850	06/338,367	9/20/83
4,404,855	06/311,509	9/20/83
4,404,856	06/245,373	9/20/83
4,404,859	06/341,112	9/20/83
4,404,861	06/285,640	9/20/83
4,404,862	06/317,070	9/20/83
4,404,863	06/220,435	9/20/83
4,404,867	06/369,885	9/20/83
4,404,871	06/308,104	9/20/83
4,404,872	06/308,105	9/20/83
4,404,873	06/310,507	9/20/83
4,404,885	06/250,580	9/20/83
4,404,886	06/293,555	9/20/83
4,404,890	06/352,932	9/20/83
4,404,892	06/217,844	9/20/83
4,404,898	06/291,014	9/20/83
4,404,909	06/362,623	9/20/83
4,404,911	06/318,664	9/20/83
4,404,912	06/249,123	9/20/83
4,404,915	06/217,792	9/20/83
4,404,916	06/218,538	9/20/83
4,404,923	06/283,278	9/20/83
4,404,934	06/284,652	9/20/83
4,404,942	06/285,591	9/20/83
4,404,967	06/456,734	9/20/83
4,404,968	06/366,447	9/20/83
4,404,975	06/324,762	9/20/83
4,404,984	06/349,533	9/20/83
4,404,991	06/427,929	9/20/83
4,404,996	06/287,155	9/20/83
4,404,997	06/253,569	9/20/83
4,405,000	06/295,767	9/20/83
4,405,001	06/302,833	9/20/83
4,405,002	06/309,825	9/20/83
4,405,003	06/229,761	9/20/83
4,405,005	06/260,736	9/20/83
4,405,009	06/275,320	9/20/83
4,405,011	06/306,554	9/20/83
4,405,015	06/326,461	9/20/83
4,405,018	06/278,439	9/20/83
4,405,027	06/311,467	9/20/83
4,405,028	06/275,113	9/20/83
4,405,030	06/244,396	9/20/83
4,405,031	06/406,898	9/20/83
4,405,032	06/261,500	9/20/83
4,405,033	06/228,432	9/20/83
4,405,037	06/272,183	9/20/83
4,405,045	06/259,664	9/20/83

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4,405,050	06/330,460	9/20/83
4,405,065	06/405,685	9/20/83
4,405,067	06/277,145	9/20/83
4,405,069	06/254,180	9/20/83
4,405,070	06/237,658	9/20/83
4,405,072	06/267,593	9/20/83
4,405,076	06/412,471	9/20/83
4,405,081	06/341,305	9/20/83
4,405,088	06/245,742	9/20/83
4,405,092	06/227,408	9/20/83
4,405,102	06/323,525	9/20/83
4,405,106	06/385,022	9/20/83
4,405,109	06/300,045	9/20/83
4,405,110	06/352,031	9/20/83
4,405,111	06/256,545	9/20/83
4,405,113	06/262,791	9/20/83
4,405,115	06/236,298	9/20/83
4,405,116	06/230,806	9/20/83
4,405,122	06/270,827	9/20/83
4,405,127	06/376,513	9/20/83
4,405,132	06/299,186	9/20/83
4,405,138	06/423,588	9/20/83
4,405,140	06/359,123	9/20/83
4,405,141	06/266,840	9/20/83
4,405,142	06/241,750	9/20/83
4,405,146	06/288,415	9/20/83
4,405,153	06/245,460	9/20/83
4,405,161	06/271,832	9/20/83
4,405,166	06/255,108	9/20/83
4,405,169	06/246,207	9/20/83
4,405,170	06/289,305	9/20/83
4,405,171	06/334,525	9/20/83
4,405,178	06/263,480	9/20/83
4,405,181	06/257,386	9/20/83
4,405,183	06/257,324	9/20/83
4,405,190	06/262,444	9/20/83
4,405,196	06/224,083	9/20/83
4,405,218	06/288,464	9/20/83
4,405,223	06/349,922	9/20/83
4,405,225	06/219,527	9/20/83
4,405,229	06/265,549	9/20/83
4,405,231	06/304,387	9/20/83
4,405,246	06/311,118	9/20/83
4,405,255	06/344,888	9/20/83
4,405,261	06/256,507	9/20/83
4,405,263	06/330,725	9/20/83
4,405,266	06/474,272	9/20/83
4,405,267	06/293,377	9/20/83
4,405,277	06/244,045	9/20/83
4,405,282	06/297,038	9/20/83
4,405,283	06/274,379	9/20/83
4,405,287	06/276,704	9/20/83
4,405,301	06/319,569	9/20/83
4,405,302	06/392,528	9/20/83
4,405,303	06/297,134	9/20/83
4,405,306	06/328,734	9/20/83
4,405,313	06/343,736	9/20/83
4,405,317	06/306,954	9/20/83
4,405,323	06/299,813	9/20/83
4,405,325	06/289,343	9/20/83
4,405,339	06/288,358	9/20/83
4,405,343	06/413,744	9/20/83
4,405,345	06/346,239	9/20/83
4,405,351	06/278,790	9/20/83
4,405,352	06/344,460	9/20/83
4,405,355	06/228,395	9/20/83
4,405,358	06/259,618	9/20/83
4,405,362	06/402,716	9/20/83
4,405,364	06/379,082	9/20/83
4,405,367	06/391,252	9/20/83
4,405,369	06/288,397	9/20/83
4,405,383	06/327,745	9/20/83
4,405,386	06/365,726	9/20/83
4,405,396	06/240,182	9/20/83
4,405,403	06/255,968	9/20/83
4,405,415	06/308,472	9/20/83
4,405,416	06/302,337	9/20/83
4,405,418	06/240,226	9/20/83
4,405,420	06/305,877	9/20/83
4,405,422	06/420,253	9/20/83
4,405,424	06/383,272	9/20/83
4,405,427	06/317,162	9/20/83
4,405,428	06/401,488	9/20/83
4,405,434	06/338,383	9/20/83
4,405,442	06/444,268	9/20/83
4,405,444	06/439,972	9/20/83
4,405,446	06/338,600	9/20/83
4,405,460	06/265,343	9/20/83
4,405,465	06/393,578	9/20/83
4,405,466	06/374,350	9/20/83
4,405,470	06/441,718	9/20/83
4,405,491	06/[illegible]5,768	9/20/83
4,405,500	[illegible]6,711	9/20/83
4,405,505	06/247,357	9/20/83
4,405,508	06/296,150	9/20/83
4,405,514	06/473,396	9/20/83
4,405,516	06/403,843	9/20/83
4,405,517	06/403,845	9/20/83
4,405,518	06/404,936	9/20/83
4,405,522	06/340,434	9/20/83
4,405,539	06/319,988	9/20/83
4,405,542	06/342,609	9/20/83
4,405,544	06/348,824	9/20/83
4,405,547	06/369,596	9/20/83
4,405,554	06/302,057	9/20/83
4,505,557	06/242,071	9/20/83
4,405,559	06/290,289	9/20/83
4,405,568	06/451,297	9/20/83
4,405,569	06/318,150	9/20/83
4,405,572	06/411,551	9/20/83
4,405,578	06/321,060	9/20/83
4,405,579	06/321,061	9/20/83
4,405,590	06/358,387	9/20/83
4,405,591	06/358,853	9/20/83
4,405,604	06/347,051	9/20/83
4,405,607	06/282,045	9/20/83
4,405,614	06/356,722	9/20/83
4,405,618	06/279,454	9/20/83
4,405,620	06/227,621	9/20/83
4,405,627	06/261,296	9/20/83
4,405,638	06/372,985	9/20/83
4,405,643	06/296,830	9/20/83
4,405,651	06/253,348	9/20/83
4,405,666	06/364,747	9/20/83
4,405,669	06/300,109	9/20/83
4,405,671	06/341,010	9/20/83
4,405,673	06/314,885	9/20/83
4,405,682	06/243,452	9/20/83
4,405,685	06/319,911	9/20/83
4,405,686	06/385,942	9/20/83
4,405,696	06/370,662	9/20/83
4,405,706	06/388,366	9/20/83
4,405,713	06/334,620	9/20/83
4,405,724	06/439,033	9/20/83
4,405,726	06/370,984	9/20/83
4,405,743	06/311,655	9/20/83
4,405,746	06/238,725	9/20/83
4,405,747	06/367,883	9/20/83
4,405,751	06/355,644	9/20/83
4,405,764	06/454,816	9/20/83
4,405,771	06/312,319	9/20/83
4,405,777	06/398,178	9/20/83
4,405,783	06/388,464	9/20/83
4,405,787	06/365,139	9/20/83
4,405,789	06/237,784	9/20/83
4,405,803	06/380,581	9/20/83
4,405,804	06/414,161	9/20/83
4,405,805	06/286,996	9/20/83
4,405,808	06/370,037	9/20/83
4,405,812	06/350,204	9/20/83
4,405,818	06/307,049	9/20/83
4,405,830	06/279,514	9/20/83
4,405,834	06/280,390	9/20/83
4,405,835	06/301,567	9/20/83
4,405,836	06/336,979	9/20/83
4,405,837	06/218,878	9/20/83

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4,405,839	06/353,644	9/20/83
4,405,848	06/282,713	9/20/83
4,405,859	06/227,403	9/20/83
4,405,860	06/225,828	9/20/83
4,405,872	06/239,624	9/20/83
4,405,878	06/307,404	9/20/83
4,405,879	06/246,588	9/20/83
4,405,884	06/257,575	9/20/83
4,405,890	06/289,506	9/20/83
4,405,896	06/319,679	9/20/83
4,405,913	06/293,199	9/20/83
4,405,914	06/303,203	9/20/83
4,405,919	06/257,783	9/20/83
4,405,938	06/265,810	9/20/83
4,405,939	06/316,465	9/20/83
4,405,961	06/290,646	9/20/83
4,405,973	06/239,360	9/20/83
4,405,977	06/296,296	9/20/83
4,405,986	06/255,030	9/20/83
4,405,990	06/282,999	9/20/83
4,405,999	06/221,735	9/20/83
4,406,007	06/313,917	9/20/83
4,406,010	06/221,189	9/20/83
4,406,014	06/250,860	9/20/83
4,406,016	06/325,162	9/20/83
4,694,509	06/777,767	9/22/87
4,694,510	06/734,862	9/22/87
4,694,516	06/822,154	9/22/87
4,694,517	07/010,668	9/22/87
4,694,521	06/876,111	9/22/87
4,694,523	06/830,054	9/22/87
4,694,524	06/854,659	9/22/87
4,694,543	06/738,276	9/22/87
4,694,546	06/804,781	9/22/87
4,694,547	06/828,443	9/22/87
4,694,556	06/811,311	9/22/87
4,694,559	06/822,818	9/22/87
4,694,569	06/847,354	9/22/87
4,694,571	06/846,049	9/22/87
4,694,575	06/900,009	9/22/87
4,694,576	06/898,721	9/22/87
4,694,579	06/834,243	9/22/87
4,694,582	06/927,129	9/22/87
4,694,597	06/788,204	9/22/87
4,694,598	06/898,636	9/22/87
4,694,601	06/799,302	9/22/87
4,694,602	06/875,069	9/22/87
4,694,604	06/901,999	9/22/87
4,694,608	06/501,636	9/22/87
4,694,614	06/898,580	9/22/87
4,694,616	06/878,415	9/22/87
4,694,617	06/832,100	9/22/87
4,694,618	06/846,013	9/22/87
4,694,625	06/847,278	9/22/87
4,694,636	06/246,437	9/22/87
4,694,639	06/814,480	9/22/87
4,694,647	06/845,294	9/22/87
4,694,663	06/816,086	9/22/87
4,694,668	06/920,393	9/22/87
4,694,670	06/687,938	9/22/87
4,694,674	06/832,531	9/22/87
4,694,678	06/820,019	9/22/87
4,694,679	06/847,440	9/22/87
4,694,681	06/748,033	9/22/87
4,694,699	06/880,664	9/22/87
4,694,700	06/779,855	9/22/87
4,694,701	06/824,664	9/22/87
4,694,706	07/023,895	9/22/87
4,694,708	06/845,960	9/22/87
4,694,717	06/762,296	9/22/87
4,694,726	06/636,219	9/22/87
4,694,727	06/771,929	9/22/87
4,694,728	06/718,034	9/22/87
4,694,738	06/818,771	9/22/87
4,694,742	06/815,913	9/22/87
4,694,750	07/005,323	9/22/87
4,694,759	06/766,000	9/22/87
4,694,760	06/793,751	9/22/87
4,694,766	06/947,015	9/22/87
4,694,767	06/922,744	9/22/87
4,694,768	06/812,731	9/22/87
4,694,769	07/001,911	9/22/87
4,694,770	06/740,850	9/22/87
4,694,773	06/837,281	9/22/87
4,694,776	06/747,662	9/22/87
4,694,777	06/751,682	9/22/87
4,694,781	06/802,961	9/22/87
4,694,787	06/583,998	9/22/87
4,694,788	06/845,308	9/22/87
4,694,812	06/853,964	9/22/87
4,694,817	06/828,323	9/22/87
4,694,820	06/941,358	9/22/87
4,694,823	06/832,382	9/22/87
4,694,824	06/869,363	9/22/87
4,694,825	06/672,275	9/22/87
4,694,834	06/846,388	9/22/87
4,694,839	06/842,831	9/22/87
4,694,841	06/747,562	9/22/87
4,694,843	06/916,116	9/22/87
4,694,849	06/859,787	9/22/87
4,694,858	06/901,684	9/22/87
4,694,865	06/752,336	9/22/87
4,694,867	06/916,224	9/22/87
4,694,868	06/805,331	9/22/87
4,694,873	06/818,536	9/22/87
4,694,874	06/801,061	9/22/87
4,694,875	06/692,425	9/22/87
4,694,876	06/744,632	9/22/87
4,694,877	06/887,485	9/22/87
4,694,878	06/886,273	9/22/87
4,694,879	06/787,801	9/22/87
4,694,880	06/418,888	9/22/87
4,694,892	07/002,598	9/22/87
4,694,893	06/868,242	9/22/87
4,694,897	06/897,379	9/22/87
4,694,907	06/832,267	9/22/87
4,694,910	06/874,657	9/22/87
4,694,911	06/705,222	9/22/87
4,694,914	06/888,664	9/22/87
4,694,916	06/910,389	9/22/87
4,694,933	06/690,499	9/22/87
4,694,934	06/563,688	9/22/87
4,694,936	06/834,575	9/22/87
4,694,938	06/738,675	9/22/87
4,694,940	06/837,071	9/22/87
4,694,948	06/802,520	9/22/87
4,694,950	06/654,131	9/22/87
4,694,953	06/743,736	9/22/87
4,694,955	06/882,409	9/22/87
4,694,957	06/943,550	9/22/87
4,694,959	06/823,640	9/22/87
4,694,961	06/776,977	9/22/87
4,694,965	06/907,877	9/22/87
4,694,967	06/853,360	9/22/87
4,694,969	06/672,108	9/22/87
4,694,971	06/937,739	9/22/87
4,694,979	06/869,740	9/22/87
4,694,981	06/935,754	9/22/87
4,694,986	06/896,647	9/22/87
4,694,994	06/759,836	9/22/87
4,695,013	06/659,358	9/22/87
4,695,015	06/837,360	9/22/87
4,695,025	06/793,963	9/22/87
4,695,027	06/869,366	9/22/87
4,695,029	06/816,934	9/22/87
4,695,039	06/803,139	9/22/87
4,695,040	06/873,100	9/22/87
4,695,045	06/889,625	9/22/87
4,695,049	06/906,142	9/22/87
4,695,057	06/736,269	9/22/87
4,695,058	06/822,966	9/22/87
4,695,060	06/858,956	9/22/87
4,695,070	06/869,235	9/22/87
4,695,081	06/663,661	9/22/87
4,695,085	06/926,121	9/22/87
4,695,088	06/891,552	9/22/87

Patent Number	Serial Number	Issue Date
4,695,094	06/897,344	9/22/87
4,695,096	06/933,579	9/22/87
4,695,098	06/864,439	9/22/87
4,695,101	06/838,597	9/22/87
4,695,103	06/856,285	9/22/87
4,695,107	06/871,848	9/22/87
4,695,114	06/849,803	9/22/87
4,695,118	06/751,024	9/22/87
4,695,120	06/780,139	9/22/87
4,695,142	06/758,786	9/22/87
4,695,146	06/917,772	9/22/87
4,695,156	06/882,006	9/22/87
4,695,157	06/786,609	9/22/87
4,695,159	06/699,140	9/22/87
4,695,165	06/918,548	9/22/87
4,695,177	06/830,467	9/22/87
4,695,179	06/801,851	9/22/87
4,695,183	06/896,716	9/22/87
4,695,195	06/836,327	9/22/87
4,695,202	06/859,008	9/22/87
4,695,203	06/722,060	9/22/87
4,695,207	06/756,784	9/22/87
4,695,217	06/553,790	9/22/87
4,695,223	06/844,460	9/22/87
4,695,228	06/286,894	9/22/87
4,695,243	06/916,207	9/22/87
4,695,245	06/830,586	9/22/87
4,695,254	06/790,868	9/22/87
4,695,257	06/727,667	9/22/87
4,695,262	06/877,580	9/22/87
4,695,265	06/848,656	9/22/87
4,695,266	06/908,235	9/22/87
4,695,269	06/778,580	9/22/87
4,695,274	06/824,879	9/22/87
4,695,275	06/806,091	9/22/87
4,695,290	06/748,236	9/22/87
4,695,304	06/743,727	9/22/87
4,695,308	06/925,845	9/22/87
4,695,309	06/840,425	9/22/87
4,695,313	06/744,513	9/22/87
4,695,320	06/786,903	9/22/87
4,695,331	06/731,072	9/22/87
4,695,342	06/717,313	9/22/87
4,695,349	06/709,247	9/22/87
4,695,353	06/797,527	9/22/87
4,695,385	06/728,204	9/22/87
4,695,396	06/827,291	9/22/87
4,695,404	06/848,783	9/22/87
4,695,414	06/625,953	9/22/87
4,695,420	06/764,525	9/22/87
4,695,437	06/874,154	9/22/87
4,695,438	06/874,153	9/22/87
4,695,443	06/701,841	9/22/87
4,695,448	06/780,274	9/22/87
4,695,473	06/813,675	9/22/87
4,695,480	06/843,546	9/22/87
4,695,482	06/821,404	9/22/87
4,695,522	06/900,280	9/22/87
4,695,541	06/696,827	9/22/87
4,695,551	06/854,174	9/22/87
4,695,555	06/924,119	9/22/87
4,695,559	06/831,142	9/22/87
4,695,561	06/709,389	9/22/87
4,695,563	06/870,043	9/22/87
4,695,589	06/499,102	9/22/87
4,695,596	06/901,505	9/22/87
4,695,613	06/778,658	9/22/87
4,695,630	06/821,569	9/22/87
4,695,635	06/717,064	9/22/87
4,695,641	06/788,810	9/22/87
4,695,643	06/782,349	9/22/87
4,695,647	06/592,074	9/22/87
4,695,652	06/783,462	9/22/87
4,695,656	06/846,011	9/22/87
4,695,663	06/891,740	9/22/87
4,695,668	06/843,095	9/22/87
4,695,674	06/771,262	9/22/87
4,695,688	06/843,435	9/22/87
4,695,702	06/850,628	9/22/87
4,695,709	06/858,386	9/22/87
4,695,728	06/833,011	9/22/87
4,695,738	06/781,946	9/22/87
4,695,754	06/738,594	9/22/87
4,695,755	06/929,612	9/22/87
4,695,760	06/339,955	9/22/87
4,695,772	06/752,266	9/22/87
4,695,775	06/863,430	9/22/87
4,695,776	06/893,943	9/22/87
4,695,787	06/769,735	9/22/87
4,695,789	06/755,405	9/22/87
4,695,793	06/580,450	9/22/87
4,695,806	06/852,476	9/22/87
4,695,807	06/838,691	9/22/87
4,695,815	06/731,385	9/22/87
4,695,819	06/839,550	9/22/87
4,695,820	06/839,303	9/22/87
4,695,825	06/856,832	9/22/87
4,695,861	07/013,186	9/22/87
4,695,886	06/785,007	9/22/87
4,695,892	06/880,512	9/22/87
4,695,896	06/726,468	9/22/87
4,695,899	06/675,289	9/22/87
4,695,911	06/730,678	9/22/87
4,695,913	06/864,878	9/22/87
4,695,920	06/896,628	9/22/87
4,695,929	06/711,971	9/22/87
4,695,955	06/686,450	9/22/87
4,695,959	06/902,262	9/22/87
4,695,971	06/676,673	9/22/87
4,695,974	06/740,976	9/22/87
4,695,975	06/663,893	9/22/87
4,695,991	06/602,453	9/22/87
4,696,009	06/806,890	9/22/87
4,696,010	06/886,169	9/22/87
4,696,014	06/909,924	9/22/87
4,696,018	06/684,717	9/22/87
4,696,023	06/638,472	9/22/87
4,696,024	06/783,453	9/22/87
4,696,025	06/870,316	9/22/87
4,696,027	06/893,116	9/22/87
4,696,029	06/808,249	9/22/87
4,696,032	06/705,935	9/22/87
4,696,033	06/694,038	9/22/87
4,696,046	06/845,154	9/22/87
4,696,051	06/815,334	9/22/87
4,696,052	06/815,432	9/22/87

NOTIFICATION OF ACCEPTANCE OF DELAYED PAYMENT OF MAINTENANCE FEE (35 U.S.C. 41(c); 37 CFR 1.378)

The patent(s) listed below are considered as not having expired but are subject to the conditions set forth in 35 U.S.C. 41(c)(2), in view of the Petition to Accept Late Payment of the maintenance fees which has been GRANTED BY THE COMMISSIONER OF PATENTS AND TRADEMARKS, as provided for under 35 U.S.C. 41(c)(1) and 37 CFR 1.378.

Patent No.	Serial No.	Patent Date	Application Filing Date	Delayed Payment Acceptance Date
4,404,668	06/279,618	9/13/83	7/01/81	10/09/91
4,624,696	06/785,756	11/25/86	10/09/85	9/24/91
4,646,399	06/832,159	3/03/87	2/21/86	9/26/91

Reissue Applications Filed

Notice under 37 CFR 1.11 (b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21 (b)).

4,615,298, Re. S.N. 07/254,079, Filed Oct. 6, 1988, Cl. 118/723, METHOD OF MAKING NON-CRYSTALLINE SEMICONDUCTOR LAYER, Shunpei Yamazaki, Owner of Record: *Semiconductor Energy Laboratory Co., Ltd., Kanagawa-Ken, Japan*, Attorney or Agent: Gerald J. Ferguson, Jr., Ex. Gp.: 134

4,674,006, Re. S.N. 07/779,910, Filed Oct. 21, 1991, Cl. 361/393, CONTACT ARRAY ASSEMBLY FOR A COMPUTER-CONTROLLED PRINTED CIRCUIT BOARD TESTING APPARATUS, Hubert Driller, et. al., Owner of Record: *Mania Electronik Automatisation Schmitten, Federal Republic of Germany*, Attorney or Agent: Jeffrey Nolton, Ex. Gp.: 214

4,771,768, Re. S.N. 07/585,500, Filed Sept. 20, 1990, Cl. 128/88, CONTROLLED MOTION ANKLE FRACTURE WALKER, George E. Crispin, Owner of Record: *United States Manufacturing Co., Pasadena, Calif.*, Attorney or Agent: Walter G. Maxwell, Ex. Gp.: 331

4,857,542, Re. S.N. 07/745,069, Filed Aug. 15, 1989, Cl. 514/404, PROPHYLACTIC AND THERAPEUTIC COMPOSITION FOR CIRCULATORY DISORDERS AND METHOD OF TREATMENT, Hiroyoshi Nishi, et. al., Owner of Record: *Mitsubishi Chemical Industries Ltd., Tokyo, Japan*, Attorney or Agent: Donald R. Castle, Ex. Gp.: 125

4,862,237, Re. S.N. 07/751,464, Filed Aug. 29, 1991, Cl. 357/30, SOLID STATE IMAGE SENSOR, Shinj Morozomi, Owner of Record: *Seiko Epson Corp., Tokyo, Japan*, Attorney or Agent: Harold I. Kaplan, Ex. Gp.: 258

4,870,962, Re. S.N. 07/765,960, Filed Sept. 26, 1991, Cl. 128/205.13, DISPOSABLE SELF-INFLATING MANUAL RESUCITATOR BAG, Lee Stinik, Owner of Record: *Inventor*, Attorney or Agent: Michael A. Mann, Ex. Gp.: 337

4,873,929, Re. S.N. 07/780,643, Filed Oct. 17, 1991, Cl. 104/172.3, PUSHER UNIT, Frank J. Witecki, Owner or Record: *Inventor*, Attorney or Agent: Michael L. Levine, Ex. Gp.: 313

4,874,906, Re. S.N. 07/777,659, Filed Oct. 16, 1991, Cl. 174/67, PLUGS ENCLOSING OUTLET COVER, Michael J. Shotey, Owner of Record: *Inventor*, Attorney or Agent: C. Robert von Hellens, Ex. Gp.: 215

4,874,978, Re. S.N. 07/780,099, Filed Oct. 17, 1991, Cl. 310/328, DEVICE FOR MAGNIFYING DISPLACEMENT OF PIEZOELECTRIC ELEMENT OR THE LIKE AND METHOD OF PRODUCING SAME, Atsuo Sakaida, et. al., Owner of Record: *Brother Kogyo Kubushiki Kaisha, Aichi-ken, Japan*, Attorney or Agent: Caroline D. Dennison, Ex. Gp.: 212

4,918,177, Re. S.N. 07/779,874, Filed Oct. 21, 1991, Cl. 536/18.7, STALIC ACID DERIVATIVES HAVING CARBONYL GROUP, Shoji Yoshimura, et. al., Owner of Record: *Mect Corp., Tokyo, Japan*, Attorney or Agent: Charles B. Rodman, Ex. Gp.: 183

4,930,452, Re. S.N. 07/780,030, Filed Oct. 21, 1991, Cl. 119/103, CATTLE STANCHION, John A. Da Silveira, Owner of Record: *Inventor*, Attorney or Agent: Julian Caplan, Ex. Gp.: 333

4,945,409, Re. S.N. 07/780,642, Filed Oct. 18, 1991, Cl. 358/88, ENDOSCOPE APPARATUS FOR DISPLAYING IMAGES BELOW THE MUCOUS MEMBRANE, Kazunari Nakamura, Owner of Record: *Olympus Optical Co. Ltd., Tokyo, Japan*, Attorney or Agent: Ellen Marcie Emas, Ex. Gp.: 262

4,957,002, Re. S.N. 07/729,204, Filed July 12, 1991, Cl. 73/761, METHOD, SYSTEM AND DEVICE FOR DETERMINING QUALITY OF ASSEMBLY OF TOOL PARTS, Willaim E. Coyle Jr., et. al., Owner of Record: *Bilco Tool Inc., Huuma, La.*, Attorney or Agent: Samuel Meerkreebs, Ex. Gp.: 265

Requests for Reexamination Filed

Notice under 37 CFR 1.11 (c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19 (a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,246,102, Reexam No. 90/002,496, Requested Oct. 31, 1991, Cl. 210/704, METHOD FOR SEPARATING POLLUTANTS FROM LIQUID, Ulf J. Hjelmner, et. al., Owner of Record: *Ulf R. Hjelmner, Nynashamn, Sweden; Hans F. Larsson, Vasterhaninge, Sweden*, Attorney or Agent: Brumbaugh, Graves, Donohue & Raymond, New York, N.Y., Ex. Gp.: 138, Requester: Irving Powers, St. Louis, Mo.

4,475,619, Reexam No. 90/002,497, Requested Oct. 31, 1991, Cl. 181/137, STETHOSCOPE WITH FLOATING DIAPHRAGM, Thomas J. Packard, Owner of Record: *Minnesota Mining & Manufacturing Corp., St. Paul, Minn.*, Attorney or Agent: John M. Hornickel, St. Paul, Minn., Ex. Gp.: 211, Requester: Owner

4,746,635, Reexam No. 90/002,498, Requested Nov. 4, 1991, Cl. 501/089, HIGH STRENGTH AND HIGH HARDNESS ALUMINA-ZIRCONIA-SILICON CARBIDE SINTERED CERAMIC COMPOSITE AND ITS MANUFACTURING PROCESS, Sigeo Inoue, et. al., Owner of Record: *Kabushiki Kaisha Riken, Tokyo, Japan, and Toshio Hirai, Izumi-Shi, Japan, and Koichi Niihara, Yokosuka, Japan*, Attorney or Agent: Armstrong, Nikaido, Marmelstein, Kubovcik & Murray, Washington, DC, Ex. Gp.: 118, Requester: Advanced Composite Materials Corp., Greer, S.C.

Department of Commerce
Patent and Trademark Office

Request for Information Regarding Process Patent Amendments made by the Omnibus Trade and Competitiveness Act of 1988

Agency: Patent and Trademark Office, Commerce.
Action: Request for information from domestic industries regarding possible adverse effects of the process patent amendments made by the Omnibus Trade and Competitiveness Act of 1988 (Pub. L. 100-418).
Date: Comments must be received on or before January 31, 1992.
For Further Information Contact: Documents and questions should be submitted to Michael K. Kirk, Assistant Commissioner for External Affairs, Box 4, Patent and Trademark Office, Washington, DC 20231. Telephone at (703) 305-9300.
Supplementary Information: The Omnibus Trade Competitiveness Act of 1988 (Pub. L. 100-418) was enacted on Aug. 23, 1988. Among other things, the Act amended title 35, United States Code, to extend the protection of a process patented in the United States also to products made by that process. As a consequence, whoever without authority imports into the United States, or sells or uses in this country, a product made by a patented process shall be liable as an infringer, if the importation, sale or use occurs during the term of the process patent. (Sections 9002 and 9003 of Pub. L. 100-418). The effective date of that amendment was Feb. 23, 1989.

Section 9007 of the Act requires the Secretary of Commerce to report to the Congress, at the end of each one-year period from the effective date of the above amendments, on the effect of these amendments on those domestic industries that submitted com-

plaints during such period, alleging that their legitimate sources of supply have been adversely affected. Such reports must be submitted for five successive years.

The third report from the Secretary of Commerce to the Congress will be submitted on Feb. 23, 1992, covering the preceding one-year period. Accordingly, it is requested that domestic industries wishing their complaints reflected in the Secretary's report ensure that any submission on this subject is received by the Department of Commerce not later than Jan. 31, 1992.

Nov. 4, 1991

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks

PATENT NOTICES

Certificates of Correction For Week of December 3, 1991

D. 309,753	4,876,876	4,907,341	4,942,734
D. 310,281	4,876,937	4,909,231	4,943,638
Re. 33,164	4,878,095	4,909,389	4,943,766
4,517,174	4,878,200	4,909,781	4,944,693
4,683,080	4,879,176	4,913,986	4,944,976
4,706,080	4,879,333	4,914,421	4,945,001
4,736,294	4,879,405	4,914,569	4,945,269
4,755,995	4,879,891	4,914,865	4,945,371
4,760,788	4,880,172	4,914,989	4,946,699
4,766,549	4,880,397	4,918,022	4,947,328
4,778,530	4,881,559	4,918,185	4,948,427
4,780,615	4,882,615	4,918,497	4,948,705
4,780,976	4,883,058	4,919,351	4,948,918
4,797,336	4,883,395	4,919,738	4,948,989
4,798,620	4,886,816	4,921,871	4,949,582
4,798,862	4,889,848	4,922,789	4,949,583
4,820,207	4,890,294	4,923,424	4,950,042
4,821,980	4,891,241	4,923,792	4,950,347
4,833,199	4,892,396	4,923,919	4,950,448
4,833,206	4,892,397	4,924,078	4,950,692
4,835,280	4,892,763	4,924,112	4,951,389
4,837,656	4,893,897	4,924,904	4,951,805
4,839,115	4,894,176	4,926,632	4,951,855
4,842,611	4,894,676	4,928,068	4,952,414
4,846,318	4,894,956	4,928,186	4,952,615
4,853,528	4,895,397	4,929,056	4,952,682
4,853,915	4,895,411	4,929,312	4,952,834
4,854,011	4,895,510	4,929,722	4,953,222
4,855,210	4,895,886	4,930,537	4,953,347
4,855,417	4,897,522	4,931,555	4,954,135
4,855,675	4,897,835	4,933,182	4,954,488
4,855,890	4,899,589	4,936,060	4,957,204
4,857,298	4,899,975	4,936,635	4,957,324
4,860,304	4,900,622	4,937,053	4,957,701
4,863,563	4,901,319	4,937,245	4,958,203
4,863,784	4,902,190	4,938,196	4,975,046
4,864,775	4,902,618	4,938,274	5,003,604
4,867,955	4,902,667	4,938,408	5,006,977
4,868,167	4,904,034	4,939,295	5,026,752
4,868,517	4,904,440	4,940,975	5,028,490
4,869,896	4,904,657	4,941,911	5,030,762
4,873,580	4,906,385	4,942,043	5,031,889
4,874,558	4,907,249	4,942,342	5,032,802

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	Toledo/Lucas County Public Library	(419) 259-5212
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	Milwaukee Public Library	(414) 278-3247

PATENT EXAMINING CORPS

JAMES E. DENNY, Assistant Commissioner
STEPHEN G. KUNIN, Deputy Assistant Commissioner

PATENT EXAMINING GROUPS	Phone Number Area Code 703	New Case Date*
CHEMICAL EXAMINING GROUPS		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110 — D. E. TALBERT, Director	308-0661	7/29/90
ORGANIC CHEMISTRY, GROUP 120 — JOHN F. TERAPANE, JR., Director	308-1235	3/29/91
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130 — BARRY S. RICHMAN, Director	308-0651	2/1/91
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150 — J. O. THOMAS, Director	308-2351	7/6/90
BIOTECHNOLOGY, GROUP 180 — EDWARD E. KUBASIEWICZ, Director	308-0196	6/2/90
ELECTRICAL EXAMINING GROUPS		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210 — D. G. KELLY, Director	308-1782	4/17/90
SPECIAL LAWS ADMINISTRATION, GROUP 220 — ROBERT E. GARRETT, Director	308-0511	3/24/90
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230 — GERALD GOLDBERG, Director	308-0754	8/15/89
PACKAGES, CLEANING, TEXTILES AND GEOMETRICAL INSTRUMENTS GROUP 240 — CARLTON CROYLE, Director	308-0771	9/15/90
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250 — JOSEPH J. ROLLA, Director	308-0956	12/1/90
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260 — BOBBY R. GRAY, Director	308-0962	6/22/90
DESIGN, GROUP 290 — ROBERT E. GARRETT, Director	308-0511	2/20/89
MECHANICAL EXAMINING GROUPS		
HANDLING AND TRANSPORTATION MEDIA, GROUP 310 — F. R. SCHMIDT, Director	308-1113	1/22/91
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320 — N. GODICI, Director	308-1148	1/29/91
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330 — J. J. LOVE, Director	308-0858	10/1/90
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340 — JOHN KITTLE, Director	308-0861	12/7/90
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 350 — A. L. SMITH, Director	308-0651	10/1/90

*A communication from the examiner should have been received in most applications filed prior to this date.

Expiration of Patents: The patents within the range of numbers indicated below expire during October 1991 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151

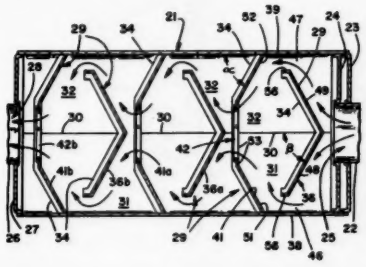
Patents ..... Numbers 3,845,504 to 3,851,335 inclusive
Plant Patents ..... 3,644 to 3,659

REEXAMINATIONS

DECEMBER 3, 1991

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,574,914 (1599th)
COMPACT, SOUND-ATTENUATING MUFFLER FOR HIGH-PERFORMANCE INTERNAL COMBUSTION ENGINE
Ray T. Flugger, Santa Rosa, Calif., assignor to Flowmaster, Inc.
Reexamination Request No. 90/002,301, Mar. 21, 1991.
Reexamination Certificate for Patent No. 4,574,914, issued Mar. 11, 1986, Ser. No. 548,304, Nov. 3, 1983.
Int. Cl.[5] F01N *1/08*
U.S. Cl. 181—268



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

ONLY THOSE PARAGRAPHS OF THE SPECIFICATION AFFECTED BY AMENDMENT ARE PRINTED HEREIN.

Column 4, lines 11–23:

The muffler of the present invention achieves extremely effective sound attenuation without undesirable back pressure and bulk or weight by forming casing **21** with a transverse cross section having a width dimension substantially greater than the height dimension. As used herein, the terms "width" and "height" refer to the muffler as oriented in FIG. **1**. It will be understood, however, that the muffler of the present invention can be installed and oriented at 90° from the orientation shown in FIG. **1**, or at any desired angle with respect to inlet pipe **22**. Regardless of the orientation, however, the muffler casing or housing is formed with an elongated transverse cross-section, *and it will be seen from FIGS. 1 and 2 that the transverse cross sectional area of the casing remains substantially constant over the length of the casing.*

Column 4, lines 57–68 Column 5, lines 1–4:

Second partition **41** is formed to extend across both the width and height dimensions of the casing and is further formed to be imperforate intermediate the casing walls, except for central opening means **42**. Thus, all of the exhaust gases are forced to converge around the back side of cup-shaped first partition **36** toward *a substantially circular* central opening **42** in the second partition. There are no auxiliary pathways or opening in the second partition which will allow sound to pass directly along the casing walls. Again, instead of providing a conical or frustoconical member, second partition **41** is provided by a pair of convergently tapered planar surfaces **51** and **52** oriented in vertical planes and connected to a central planar surface **53** formed with opening **42** therein. Gases, therefore, converge in substantially a single plane, the horizontal plane.

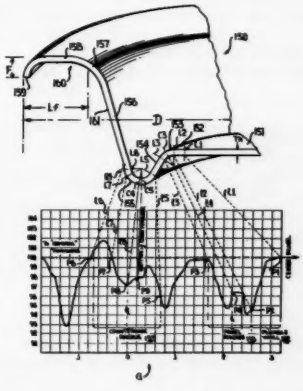
1. A compact, sound-attenuating muffler for a high-performance, internal combustion engine or the like [including] *comprising:* a casing having *a length and* an inlet opening formed for the flow of exhaust gases into said casing and an outlet opening formed for the discharge of gases from said casing, and partition means positioned in and supported from said casing including a divergently tapered first partition formed to deflect gases toward side walls ofsaid casing, and a convergently tapered second partition positioned in and supported from said casing down-stream of said first partition and formed with central opening means therein for convergence of gases from said side walls to said opening[, wherein the improvement in said muffler comprises:]*:*

said casing being formed with a transverse cross-section having a width dimension substantially greater than the height dimension;

said first partition being an imperforate member formed to extend over the full height dimension of said casing and being formed to terminate short of the full width dimension of said casing to define a pair of openings proximate opposite side walls of said casing; [and]

said second partition being formed to extend across both the width and height dimensions of said casing and being imperforate intermediate said casing walls except for said central opening means[.]*; and said transverse cross-section of said casing having an area which is substantially constant over said length of said casing.*

B1 4,606,472 (1600th)
REINFORCED CAN END
William L. Taube, Murrietta, Calif., and David A. Roberts, Wokingham, England, assignors to Metal Box p.l.c., Reading, England
Reexamination Request No. 90/002,171, Oct. 22, 1990.
Reexamination Certificate for Patent No. 4,606,472, issued Aug. 19, 1986, Ser. No. 806,979, Dec. 9, 1985.
Division of Ser. No. 579,977, Feb. 14, 1984, Pat. No. 4,571,978
Int. Cl.[5] B65D *8/08*
U.S. Cl. 220—500



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1–12** and **13** are cancelled.

New claims **14–25** and **26** are added and determined to be patentable.

14. A reinforced pressure resistant can end comprising a metal-

lic blank having a generally circular center panel, a panel radius joining the central panel to a generally frusto-conical peripherally inner wall converging in a direction toward said center panel and defining with said panel radius and said center panel a generally interior frusto-conical chamber subject to internal pressure when the can end is flanged to an associated can body, an annular exteriorly opening generally U-shaped in cross-section reinforcing countersink radius, said generally U-shaped countersink radius being defined by a bottom and peripherally inner and outer leg portions, said inner leg portion joining said countersink radius to said frusto-conical peripherally inner wall, said outer leg portion joining said countersink radius with a generally frusto-conical peripherally outer wall, said frusto-conical walls being in diverging relationship relative to each other in a direction away from said countersink radius, said outer frusto-conical wall merging with a flange adapted to be seamed to a can body, said metallic blank having a nominal undeformed thickness reflected by the cross-sectional thickness of unformed portions of said center panel, and said outer leg portion of said countersink radius having a cross-sectional thickness greater than the cross-sectional thickness of the unformed portions of said center panel and greater than the cross-sectional thickness of said bottom of the generally U-shaped countersink radius.

B1 4,894,975 (1601st)

METHOD AND APPARATUS FOR MAKING RECLOSABLE BAGS WITH FASTENER STRIPS IN A FORM FILL AND SEAL MACHINE

Steven Ausnit, New York, N.Y., assignor to Minigrip, Inc.

Reexamination Request No. 90/002,190, Nov. 2, 1990.
Reexamination Certificate for Patent No. 4,894,975, issued Jan. 23, 1990, Ser. No. 166,024, Mar. 9, 1988.
The portion of the term of this patent subsequent to Dec. 1, 2004, has been disclaimed.
Int. Cl.[5] B65B *61/18, 9/08*
U.S. Cl. 53—412

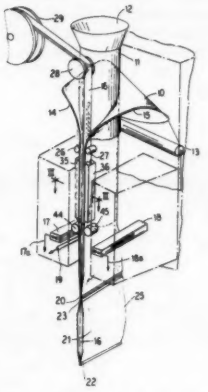
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–19** is co ıfirmed.

1. The method of forming a vertical tubular form fill reclosable bag from a sheet of plastic film comprising the steps:

continuously feeding a supply of thin thermoplastic film from a supply means;

wrapping the film into tubular shape over a filling spout bringing the lateral edges of the film together in adjacent relationship to form a tube;



feeding a continuous supply of plastic zipper strip having webs with first and second reclosable pressure interlocking members thereon into a space between said film edges;

attaching the webs of said members to the film between said film edges so that said strip provides the sole means joining said edges and said strip provides a reopenable closure for a bag formed of said film; and

wherein said interlocking members are joined by one of said webs and said one web must be separated for access to the interior of a bag formed by said film.

STATUTORY INVENTION REGISTRATIONS

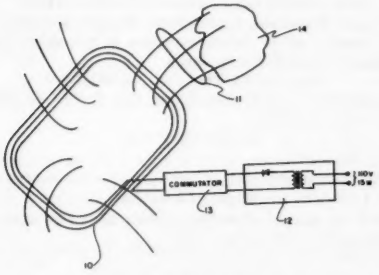
PUBLISHED DECEMBER 3, 1991

A statutory invention registration is not a patent. It has the defensive attributes of a patent but does not have the enforceable attributes of a patent. No article or advertisement or the like may use the term patent, or any term suggestive of a patent, when referring to a statutory invention registration. For more specific information on the rights associated with a statutory invention registration see 35 U.S.C. 157.

H998
PEST DISLODGEMENT BY ELECTROMAGNETIC FIELDS

Reinhold Gerharz, 8703 Burdette Rd., Bethesda, Md. 20034

Filed Aug. 25, 1989, Ser. No. 398,569
Int. Cl.[5] A01M *1/22*; H05C *3/00*
U.S. Cl. 43—124 **4 Claims**



1. An apparatus for saturating a pest infested area with an electromagnetic field, comprising:

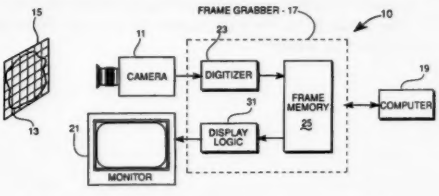
an open air coil placed in proximity to a pest infested area;

means for effecting a d.c. current flow in said coil, whereby an electromagnetic field is generated having an intensity in accordance with the number of turns on the coil and the current flow therethrough.

H999
TRANSPARENCY DISTORTION MEASUREMENT PROCESS

Harold S. Merkel, Beavercreek, and Harry L. Task, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 13, 1990, Ser. No. 582,463
Int. Cl.[5] G01N *21/17*
U.S. Cl. 356—239 **6 Claims**



1. A method for measuring optical distortion in a transparency, comprising the steps of:

(a) providing a grid board having well defined grid lines of preselected spacing thereon;

(b) acquiring an analog image of said grid board through a transparency;

(c) digitizing said analog image to form a digitized image of said grid board and transparency, said digitized image comprising a multiplicity of pixels defining the shape of said grid as viewed through said transparency;

(d) selecting a threshold luminance value for said pixels at or above which threshold luminance value said pixels are assigned an on value and below which threshold luminance value said pixels are assigned an off value;

(e) locating on said digitized image the on and off pixels defining said grid lines; and

(f) determining the optical distortion of said transparency by comparing the shape of said grid lines in said digitized image to the shape of said preselected grid lines of said grid board.

H1000
WATER BASED SYNTHETIC HYDROCARBON DRILLING FLUID AND SPOTTING FLUID

Arvind D. Patel, and Raymond E. McGlothlin, both of Houston, Tex., assignors to M-I Drilling Fluids Company, Houston, Tex.

Continuation-in-part of Ser. No. 535,110, Jun. 8, 1990, which is a continuation-in-part of Ser. No. 503,304, Mar. 30, 1990, abandoned. This application Aug. 16, 1990, Ser. No. 568,074
Int. Cl.[5] C09K *7/06, 7/02*
U.S. Cl. 507—103 **31 Claims**

1. An improved water based drilling fluid, characterized by minimal toxicity to plant and aquatic life and environmental compatibility, said improved drilling fluid comprising:

a. an aqueous continuous phase;

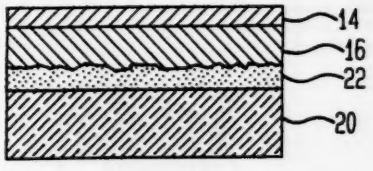
b. an oil-in-water emulsifier; and

c. an unhydrogenated synthetic hydrocarbon, said synthetic hydrocarbon having a molecular weight of from about 120 to about 1000 and wherein said synthetic hydrocarbon is synthesized from one or more olefinic monomers having a chain length of C_2 to C_{14}.

H1001
METHOD OF TRANSFERRING AN OPTICAL QUALITY FILM

John I. Thackara, Sunnyvale, Calif., assignor to The United States of Amercia as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 21, 1989, Ser. No. 416,681
Int. Cl.[5] B05D *5/12*; C25D *5/00, 5/12*
U.S. Cl. 427—124 **4 Claims**



1. Method of transferring a relatively thick metal film of excellent conductivity and of high optical quality to a secondary substrate from a master substrate, said method including the steps of:

(A) evaporation depositing an adhesion film followed by a conductive film onto a master substrate while exposing the assembly to air between evaporations,

(B) electroplating a layer of the same conductive film onto the conductive film of step (A) of sufficient thickness to achieve the necessary conductivity in the electroplated layer,

(C) bonding a secondary substrate to the electroplated layer with a replication cement, and

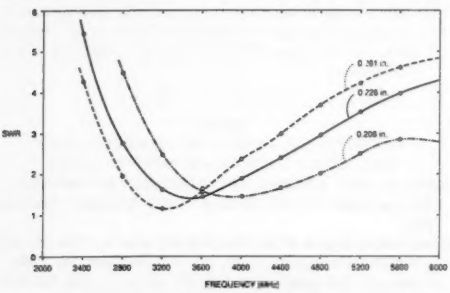
(D) separating the secondary substrate and both bonded

conductive layers from the adhesion coated master leaving the optical quality surface of the conductive electrode exposed.

H1002
MICROWAVE ABSORBING MATERIAL

Harold T. Hahn, 661 Teresi La., Los Altos, Calif. 94024

Filed Apr. 16, 1990, Ser. No. 509,670
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—408 **3 Claims**



1. A microwave absorbing material for the range 2500 to 6000 MHz, comprising:

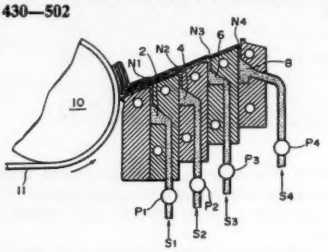
a matrix of flexible silicone, forming 66 to 73 percent by weight of the absorbing material,

hollow carbon microspheres having a range of sizes between 90 and 350 microns outside diameter, said microspheres being mixed uniformly into said matrix to form 27 to 34 percent by weight of the absorbing material.

H1003
PROCESS FOR PRODUCING PHOTOGRAPHIC MATERIALS

Masao Ishiwata; Norio Kawame; Takeshi Sakurai, all of c/o Konica Corporation No. 28, Horinouchi, Odawara-shi Kanagawa-ken; Mieji Nakano; Kazuhide Tamazawa; Nobuyuki Kimura; Toshio Saito; Gentaro Hada, all of c/o Konica Corporation No. 1, Sakura-machi, Hino-shi Tokyo 191, all of Japan

Filed Feb. 15, 1990, Ser. No. 480,279
Claims priority, application Japan, Feb. 17, 1989, 1-36060
Int. Cl.[5] B05D *1/36, 1/30, 1/02;* **G03C** *1/46*
U.S. Cl. 430—502 **5 Claims**



1. In a process for producing a photographic material by coating an assembly of superposed liquid photographic layers onto the surface of a moving base support, the improvement wherein

said assembly comprises at least three superposed liquid photographic layers in which the dynamic surface tension is substantially inverted in a certain intermediate layer of the assembly,

a peak dynamic surface tension occurs in said certain intermediate layer with the difference between said peak and the dynamic surface tension of any adjacent layer being at least 3 dynes/cm; and

the topmost layer of said assembly is formed of a coating solution that has a lower dynamic surface tension than the coating solutions for any other layers of the assembly by at least 5 dynes/cm.

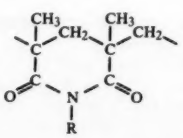
H1004
THERMOPLASTIC RESIN COMPOSITION

Isao Sasaki, Hiroshima; Kozi Nishida, Toyama, and Hisao Anzai, Ohtake, all of Japan, assignors to Mitsubishi Rayon Company Limited, Tokyo, Japan

Filed Jul. 18, 1989, Ser. No. 381,478
Claims priority, application Japan, Aug. 4, 1988, 63-194822; Aug. 4, 1988, 63-194823
Int. Cl.[5] C08F *8/00*
U.S. Cl. 525—132 **1 Claim**

1. A thermoplastic resin composition which comprises:

(A) 1–99 parts by weight of a polymer containing at least 10% by weight of methacrylimide units represented by the formula (I) below:



(I)

(wherein R denotes a hydrogen atom or a C_1–C_{20} hydrocarbon selected from the group consisting of aliphatic, aromatic or alicyclic hydrocarbons) and polymer by-products having functional groups selected from the group consisting of acid functional groups, acid anhydride functional groups, and mixtures thereof wherein the acid functional groups and acid anhydride functional groups in the polymer by-product are more than 0.4 milliequivalents for the polymer, and

(B) 99–1 parts by weight of at least one kind of thermoplastic resin selected from the group consisting of styrene-maleimide copolymer, polyphenylene ether-polystyrene blend polymer, polyaryl ester (all aromatic polyester), and polyether imide (with the total amount of (A) and (B) being 100 parts by weight).

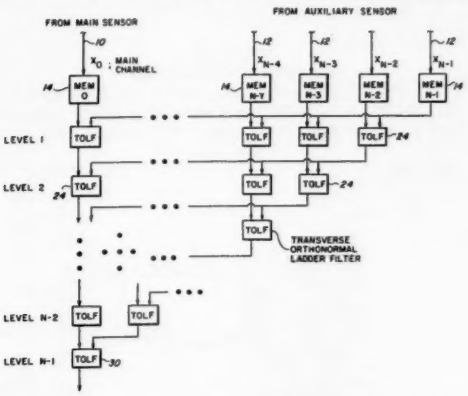
H1005
GRAM-SCHMIDT SPACE-TIME ADAPTIVE FILTER USING TRANSVERSE ORTHONORMAL LADDER FILTERS

Karl Gerlach, Dunkirk, Md., assignor to United States of America, Washington, D.C.

Filed Dec. 26, 1990, Ser. No. 635,903
Int. Cl.[5] H03H *7/01*
U.S. Cl. 342—378 **7 Claims**

1. In a Gram-Schmidt noise cancelation system having a plurality of individual decorrelation elements for sequentially decorrelating a main input signal from a plurality of auxiliary

input signals for canceling the correlated noise components therefrom to thereby yield one filtered output signal, the improvement wherein each individual decorrelation element comprises a transverse orthonormal ladder filter.



H1006

MULTILEVEL CLASSIFIER STRUCTURE FOR GAS TURBINE ENGINES

Phillip E. Zwicke, Santa Barbara, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

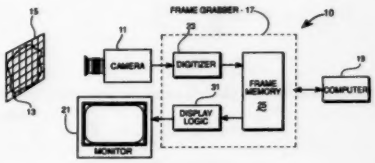
Filed Mar. 27, 1990, Ser. No. 499,935
Int. Cl.[5] G01B *7/16*
U.S. Cl. 364—551.01 **3 Claims**

1. A digital diagnostics system which monitors aeromechanical performance of a gas turbine engine, said gas turbine engine having a compressor, a combustion chamber and a turbine, said digital diagnostics system comprising:

a plurality of strain gages at locations on said gas turbine engine, said strain gages outputting a plurality of actual analog strain signals in response to said aeromechanical performance of said gas turbine engine;

means for converting said analog strain signals from said plurality of strain gages into a plurality of actual digital strain signals;

a system memory within each of said plurality of strain gages and their locations are identified, said system memory also identifying a set of stored strain signals which are characteristic of a set of aeromechanical phenomena, said aeromechanical phenomena including: resonance, flutter, separated flow vibration, missing vane blade, rotating stall, surge, blade rub, non-resonant vibration, and short circuits in said gas turbine engine; and



a means for correlating said set of stored strain signals from said system memory with said actual digital strain signals from said converting means to identify said aeromechanical phenomena of said gas turbine engine.

REISSUES

DECEMBER 3, 1991

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

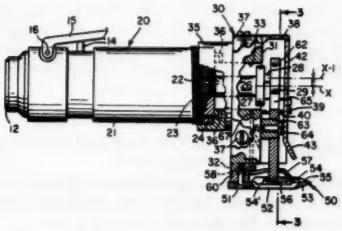
Re. 33,756
PILE CARPET TRIMMER

William E. Carder, 26 Sandle St., Fairport, N.Y. 14450

Original No. 4,825,547, dated May 2, 1989, Ser. No. 33,468, Apr. 2, 1987. Application for reissue Jul. 27, 1990, Ser. No. 563,319

Int. Cl.[5] **B26B** *19/02*

U.S. Cl. 30—216 **19 Claims**



18. A pneumatically operated tool, comprising

a housing having adjacent one end thereof a compressed air inlet disposed to be connected to a supply of compressed air, a compressed air outlet adjacent its opposite end, and a valve operable selectively to admit compressed air from said supply to the interior of said housing,

a head removably mounted adjacent one end thereof on said opposite end of said housing and having therein a chamber communicating with said outlet to receive compressed air exhausted therefrom,

a shaft mounted in said housing to be rotated by the compressed air admitted to said housing, and extending adjacent one end thereof into said head, and

means removably mounting a tool on said shaft adjacent said head and externally of said chamber for operation by said shaft upon rotation thereof,

said head having therein adjacent the opposite end thereof an exhaust opening communicating at one end with said chamber and confronting adjacent its opposite end on said tool to direct said exhausted air from said chamber toward said tool.

Re. 33,757
DIAMOND DRILL BIT WITH VARIED CUTTING ELEMENTS

Gary E. Weaver, Conroe, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Original No. 4,602,691, dated Jul. 29, 1986, Ser. No. 618,113, Jun. 7, 1984. Application for reissue Feb. 23, 1990, Ser. No. 484,510

Int. Cl.[5] **E21B** *10/50*

U.S. Cl. 175—329 **4 Claims**

1. An earth boring bit which comprises in combination:

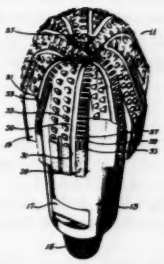
a body having one end that includes means for connection to a drill string member;

matrix material formed on the opposite end to have alternate radially extending lands extending to an outermost gage portion and radially extending water courses;

at least one row of polygon shaped, polycrystalline diamond cutting elements extending [a predetermined distance] *about 0.085 inch* from the matrix material into an apex to form relief kerfs in *a* geological formation during drilling;

one of the water courses being positioned immediately behind the row of diamond cutting elements;

a plurality of generally blunt cutting elements positioned in a row to extend from the matrix [a predetermined distance] *about 0.080 inch* and follow in between the apexes



of the cutting elements to dislodge formation between the kerfs.

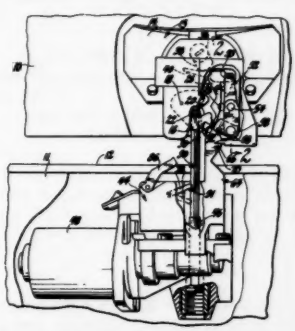
Re. 33,758
CLOSURE PANEL PULL DOWN MECHANISM

David E. Compeau, Mt. Clemens; Howard W. Kuhlman, Troy, and Lloyd W. Rogers, Jr., Utica, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Original No. 4,746,153, dated May 24, 1988, Ser. No. 52,914, May 22, 1987. Application for reissue Sep. 28, 1989, Ser. No. 413,579

Int. Cl.[5] **E05C** *13/06*

U.S. Cl. 292—216 **5 Claims**



4. In a vehicle body including a compartment panel spring-loaded for movement between open and closed positions with respect to a compartment defined by a body panel, a latch and pull down mechanism comprising:

a latch assembly mounted on one of the panels and having a latch bolt spring biased to an unlatched position and a detent lever for holding the latch bolt in the latched position;

a striker assembly mounted on the other panel and adapted for engagement by the latch bolt of the latch assembly to latch the striker assembly to the latch assembly;

a pulldown mechanism mounting one of said assemblies on its associated panel and having a motorized drive unit for moving said one assembly between an extended position where the striker and the latch bolt are engaged together upon partial closing movement of the closure panel, and a retracted position in which the closure panel is in the closed position;

means adapted to operate the motorized drive unit to move said one assembly to the retracted position to pull the closure panel

to the closed position in response to latching engagement between the striker and the latch bolt;

remote opening means actuatable by the user for selectively operating the motorized drive unit to move said one assembly from the retracted position toward the extended position;

and cam means acting in response to motorized movement of said one assembly from its retracted position toward its extended position to cam the detent lever to a position releasing the detent lever from the latch bolt whereby the latch bolt is spring biased to the unlatched position thereby disconnecting the latch assembly from the striker and freeing the compartment panel for spring-loaded movement to the open position.

Re. 33,759

AQUEOUS SYSTEMS CONTAINING SILANES FOR RENDERING MASONRY SURFACES WATER REPELLANT

Ralph J. DePasquale, Milan, Italy, and Michael E. Wilson, Middleburg, Fla., assignors to PCR Group, Inc., Gainesville, Fla.

Original No. 4,648,904, dated Mar. 10, 1987, Ser. No. 829,530, Feb. 14, 1986. Application for reissue Mar. 10, 1989, Ser. No. 321,845

Int. Cl.[5] **C09D** *5/20*

U.S. Cl. 106—2 **27 Claims**

1. An aqueous silane emulsion composition useful to render a [porous ceramic] *masonry* material water repellant which consists essentially of (a) from 1% to 40% by weight of hydrolyzable silane having a molecular weight up to about 500 and the general formula:

$$R_n—Si—(R')_{4-n}$$

wherein R is a C_1–C_{20} hydrocarbyl or halogenated hydrocarbyl group, R′ is C_1–C_3 alkoxy or halide or amino or carboxyl group, and n is 1 or 2, or oligomers thereof, (b) from 0.5 to 50% by weight of the silane component of an emulsifier having an HLB value of from 4–15, and (c) water.

Re. 33,760

HIGH PURITY, HIGH TEMPERATURE PIPE THREAD SEALANT PASTE

Ronald A. Howard, Brook Park, Ohio, assignor to Ucar Carbon Technology Corporation, Danbury, Conn.

Original No. 4,872,914, dated Oct. 10, 1989, Ser. No. 187,846, Apr. 29, 1988. Application for reissue Sep. 28, 1990, Ser. No. 589,614

Int. Cl.[5] **C09D** *3/00*

U.S. Cl. 106—285 **7 Claims**

1. A [pipe thread sealant] paste composition comprising from about 30 to about 80 percent by weight of natural flake graphite particles of a size sufficient to pass through a 100 Tyler mesh sieve and a liquid carrier comprising a mixture of mineral oil and from 5 to 60 percent by weight petrolatum.

Re. 33,761

RICINOLEATE PLASTICIZERS FOR POLYURETHANE COMPOSITIONS

Melvin Brauer, East Brunswick; William J. Downey, Linden, and Frank C. Naughton, Mountainside, all of N.J., assignors to CasChem, Inc., Bayonne, N.J.

Original No. 4,666,969, dated May 19, 1987, Ser. No. 837,555, Mar. 3, 1986. Continuation-in-part of Ser. No. 713,379, Mar. 19, 1985, abandoned. Application for reissue Oct. 30, 1989, Ser. No. 428,685

Int. Cl.[5] **C08K** *5/10;* **C08L** *75/04*

U.S. Cl. 524—310 **14 Claims**

1. A polyurethane gel composition comprising about 10 to 90 parts by weight of the liquid reaction product of an organic polyisocyanate and a polyol in the presence of about 90 to 10 parts by weight of a ricinoleate plasticizer compound having a total solubility parameter of [between about 8.3 and 8.9 or] between about 9.1 and 9.7.

PLANT PATENTS

GRANTED DECEMBER 3, 1991

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,728

ROSE PLANT: 'SMOOTH PERFUME'

Harvey D. Davidson, #3 El Verano Rd., Orinda, Calif. 94563

Filed Jan. 3, 1991, Ser. No. 638,439

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct thornless variety of rose plant of the hybrid tea class, substantially as herein shown and described.

7,729

ROSE PLANT: 'SMOOTH MELODY'

Harvey D. Davidson, #3 El Verano Rd., Orinda, Calif. 94563

Filed Sep. 17, 1990, Ser. No. 583,955

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—22 **1 Claim**

1. A new and distinct thornless variety of rose plant of the Floribunda class, substantially as herein shown and described.

7,730

"ROYAL FORELLE" PEAR TREE

David B. Lowry, Talent, Oreg., assignor to Associated Fruit Company, Phoenix, Oreg.

Filed Mar. 26, 1990, Ser. No. 500,241

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—36 **1 Claim**

1. A new and distinct variety of pear tree substantially as illustrated and described and which is somewhat remotely similar to the "Red Angelo" pear tree, (U.S. Plant Pat. No. 4,315) but from which it is distinguished by having considerably more vigorous growth including longer shoots and leaves more tightly bunched and producing fruit which are consistently larger but less uniform with skin which is more smooth and heavily waxed, and which is characterized at maturity by a skin coloration of burgundy red with a yellow under coloration with medium size submerged red dots and which has distinctively white flesh.

7,731

ROBINIA 'PURPLE CROWN'

William Flemer, III, Princeton, N.J., assignor to Rutgers University, New Brunswick, N.J.

Filed May 7, 1990, Ser. No. 520,358

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinct Robinia hybrid as described and illustrated characterized as to novelty by the vigorous growth, with narrow more upright crown of branches than either parent, the abundant flowering resulting in pendulous racemes of purple pea-shaped flowers with mild fragrance, nearly thornless when branches are mature, and its tolerance of heat, drought and high pH soils.

7,732

DOGWOOD TREE- 'RUTLAN'

Elwin R. Orton, Jr., Somerville, N.J., assignor to Rutgers University, New Brunswick, N.J.

Filed Jul. 30, 1990, Ser. No. 560,547

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—51 **1 Claim**

1. A new and distinct cultivar of dogwood tree, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its exceptionally high vigor and highly floriferous small flowering form, similar to its pollen parent as to its dense, spreading form but becoming much taller with age, intermediate to the two parents as to characteristics of the overwintering flower buds, time of flowering, and size of floral bracts, and exhibiting resistance to dogwood borers and "dogwood decline."

7,733

POINSETTIA NAMED GROJIBI

Eduard Gross, 16250 Blanzac, Nanteuillet, France

Filed Dec. 6, 1989, Ser. No. 446,881

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinctive Poinsettia cultivar, substantially as herein shown and described, particularly distinguished by large, bright pink bracts, large thick stems and leaves and a short, self-branching growth habit.

7,734

POINSETTIA NAMED GROSTAR

Bruno Gross, "Le Bois" Angeac Champagne, 16130 Segonzac Charente, France

Filed Dec. 6, 1989, Ser. No. 446,882

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinctive Poinsettia cultivar, substantially as herein shown and described, particularly distinguished by large, bright red bracts, large thick stems and leaves and a short, self-branching growth habit.

7,735

GUZMANIA PLANT NAMED MORADO

Gerardus J. Bak, Assendelft; Nicolaas D. Steur, Oude Niedorp, and Elly Bak, Assendelft, all of Netherlands, assignors to Corn. Bak B.V., Netherlands

Filed May 22, 1990, Ser. No. 526,997

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—88 **1 Claim**

1. A plant of a new and distinct cultivar of Guzmania plant named Morado, as illustrated and described.

7,736

***FICUS BENJAMINA* PLANT NAMED REGINALD**

Reginald Deroose, Droogte 139, 9050 Evergem, Belgium

Filed Aug. 17, 1990, Ser. No. 569,005

Int. Cl.[5] A01H *5/00*

U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct cultivar of *Ficus benjamina* plant named 'Reginald', as illustrated and described.

PATENTS

GRANTED DEC. 3, 1991

ERRATA

For CLASS	See PATENT NO.
454-162	5,069,112
454-252	5,069,113
454-297	5,069,114
454-166	5,069,115
220-270	5,069,345
273-001	5,069,441
359-200	5,069,515
385-147	5,069,516
385-130	5,069,517
385-043	5,069,518
385-032	5,069,519
385-001	5,069,520
385-024	5,069,521
385-039	5,069,522
385-135	5,069,523
385-059	5,069,524
385-100	5,069,525
385-101	5,069,526
359-823	5,069,527
359-233	5,069,528
359-601	5,069,530
359-055	5,069,531
359-056	5,069,532
359-076	5,069,533
359-054	5,069,534
359-273	5,069,535
359-689	5,069,536
359-557	5,069,537
359-871	5,069,538
359-514	5,069,539
359-853	5,069,540
400-074	5,069,556
400-120	5,069,557
205-073	5,069,758
205-073	5,069,759
205-080	5,069,760
205-183	5,069,761
205-137	5,069,762
205-326	5,069,763
525-397	5,069,818
423-181	5,069,884

ERRATA—Continued

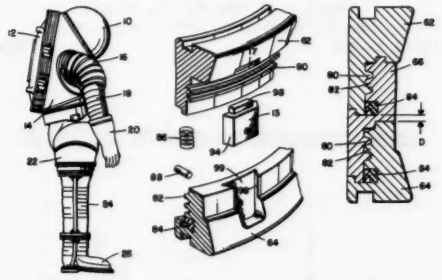
549-221	5,070,139
359-330	5,070,260
395-725	5,070,443
395-425	5,070,444
395-500	5,070,445
395-500	5,070,446
395-725	5,070,447
395-575	5,070,448
395-325	5,070,449
395-750	5,070,450
395-375	5,070,451
395-141	5,070,465
395-143	5,070,466
395-166	5,070,467
395-550	5,070,468
395-500	5,070,474
395-375	5,070,475
395-575	5,070,476
395-132	5,070,477
395-575	5,070,479
361-415	5,070,529

PATENTS

GRANTED DECEMBER 3, 1991

GENERAL AND MECHANICAL

5,068,919
SPACESUIT SIZING SYSTEM
Robert R. MacKendrick, Milford, and Mario Gonsalves, Shelton, both of Conn., assignors to Air-Lock, Incorporated, Milford, Conn.
Filed Jul. 17, 1990, Ser. No. 553,980
Int. Cl.[5] A62B *17/00;* **F16L** *25/00, 9/22*
U.S. Cl. 2—2.1 A **26 Claims**



1. Apparatus for adjusting the size of a spacesuit comprising:
(a) a first annular component having first and second sides, the first side including means for attaching the first annular component to a first portion of the spacesuit and the second side having a first screw thread;
(b) a second annular component having first and second sides, the first side including means for attaching the second annular component to a second portion of the spacesuit and the second side having a second screw thread;
(c) a third annular component having first and second sides, the first side having a third screw thread for mating with the first screw thread on the first component, said first and third components having a screwed-together state wherein said first and third screw threads are screwed together, and the second side having a fourth screw thread for mating with the second screw thread on the second component, said second and third components having a screwed-together state wherein said second and fourth screw threads are screwed together;
(d) first means for interlocking the first and third components, said means having a first state in which the first and third screw threads on said first and third components cannot be unscrewed and a second state in which said first and third screw threads can be unscrewed; and
(e) second means for interlocking the second and third components, said means having a first state in which the second and fourth screw threads on said second and third components cannot be unscrewed and a second state in which said second and fourth screw threads can be unscrewed.

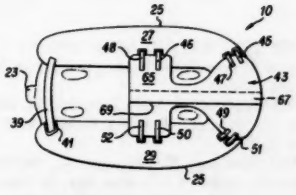
5,068,920
DRY SUIT/WATER SPORT SUIT WITH REINFORCED SEAT
Robert D. Bray, Milwaukie, Oreg., assignor to O. S. Systems, Incorporated, Scappoose, Oreg.
Filed Jan. 18, 1991, Ser. No. 642,810
Int. Cl.[5] A41D *13/00*
U.S. Cl. 2—21 R **7 Claims**

1. In a water sport suit made of waterproof material and having a back portion including a seat portion comprising an exterior nylon fabric having an interior coating of polyurethane,

a heat and stress resistant patch mounted on the exterior nylon fabric of the seat portion of the suit and entirely covering the same, the patch comprising an interior layer of neoprene having an exterior skin of fabric laminated thereto, the entire area of the patch being adhesively

secured to the exterior nylon fabric of the seat portion of the suit and the patch being stitched to the seat portion of the suit only at the perimeter of the patch.

5,068,921
CANINE BULLET-PROOF VEST
Frank T. Jones, 1732 Biscayne Ave., South Daytona, Fla. 32019
Filed May 9, 1989, Ser. No. 349,490
Int. Cl.[5] F41H *1/02*
U.S. Cl. 2—2.5 **4 Claims**



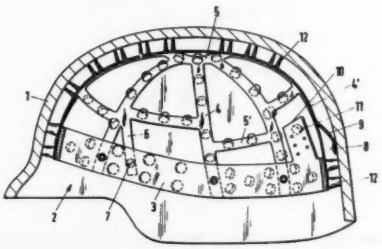
1. An improved canine vest comprising:
(a) an elongated body portion sized to cover the torso of a dog, said body portion being longitudinally split at a location thereon adapted to be placed at the underside of said dog and said vest further including a chest covering portion;
(b) said split defining first and second elongated sides of said vest covering sides of said dog and fastening means for fastening said sides in close adjacency;
(c) a plurality of pockets formed on inner surfaces of said body portion including at least a first pocket overlying an area of said vest covering a side of said dog and a second pocket in said chest covering portion;
(d) a bullet-resistant pad removably placed in each of said first and second pockets, said pads being sized and configured to protect at least the chest and one side of said dog and vital areas and organs of said dog thereunder.

5,068,922

MILITARY SAFETY HELMET

Christian Zahn, Braunschweig, Fed. Rep. of Germany, assignor to Schuberth-Werk GmbH. & Co., KG, Braunschweig, Fed. Rep. of Germany

Continuation of Ser. No. 425,723, Oct. 24, 1989, Pat. No. 4,987,609. This application Dec. 21, 1990, Ser. No. 631,960
The portion of the term of this patent subsequent to Jan. 29, 2008, has been disclaimed.
Int. Cl.[5] A42B *3/00*; A62B *18/00*
U.S. Cl. 2—6 15 Claims



1. An internal band arrangement forming a supporting basket for a military safety helmet with an outer cap resistant to bombardments, comprising:

(a) an encircling annular supporting band;

a plurality of bands extending in a radiating manner from a central fastening piece adapted to be located near the top of said helmet, the ends of said radiating bands being connected to said supporting band;

(c) at least one band connecting adjacent members of pairs of said adjacent radiating bands;

(d) bosses formed on said supporting band and said radiating bands so as to point towards an inner face of said helmet cap, the radiating bands having a width substantially the same as said bosses; and

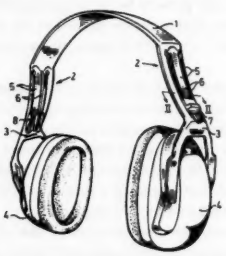
(e) means, including fastening strips extending from at least some of said radiating bands, for firmly connecting said internal band arrangement to said helmet cap so that said band arrangement rests against the inner face of said helmet cap via at least some of said bosses to form a supporting basket.

5,068,923

NOISE ATTENUATOR ATTACHMENT ARM

Ingvar Sjöqvist, Linneavägen, Sweden, assignor to Milmas AB, Gothenburg, Sweden

PCT No. PCT/SE89/00238, § 371 Date Oct. 24, 1990, § 102(e) Date Oct. 24, 1990, PCT Pub. No. WO89/10107, PCT Pub. Date Nov. 2, 1989
PCT Filed Apr. 27, 1989, Ser. No. 598,713
Claims priority, application Sweden, Apr. 28, 1988, 8801602-7
Int. Cl.[5] A42B *1/06*; G10K *11/00*
U.S. Cl. 2—209 10 Claims



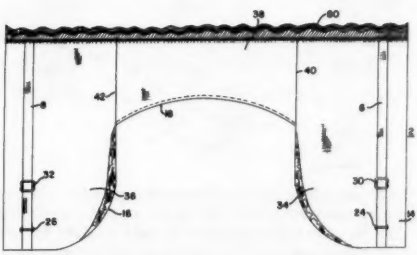
1. A sprung attachment arm for a sound attenuating device forming part of a head stirrup or adapted to be fitted to a protective helmet, said arm (2) being adapted at one end thereof for attachment to a protective ear muff (4), wherein the arm has an elongate, straplike configuration along at least part of a length thereof, and defines at least one element which functions as a sprung leg (5), and which forms an angle with adjacent elements of the straplike part, said angle increasing as the arm is bent outwardly such that the muff is spring-biased against the head of a wearer with a relatively constant pressure over a relatively wide bending range.

5,068,924

SHOULDER PAD ASSEMBLY

Linda Ross, 143 Sullivan St., Apt. C1, New York, N.Y. 10012

Filed Apr. 12, 1990, Ser. No. 508,804
Int. Cl.[5] A41B *13/06*; A41D *1/20, 11/00*
U.S. Cl. 2—268 1 Claim



1. A should pad assembly for fashionably shaping the shoulders of a wearer's clothing, said shoulder pad assembly comprising:

pad means for conforming to a wearer's shoulders, when worn as underwear, and thus adding soft bulk beneath an innermost layer of outergarments of a group consisting of shirts, blouses, dresses, tunics, sweaters, and the like, said pad means for fashionably shaping the shoulders of a wearer's garments, said shoulder pad means comprising a pair of fashionably shaped soft non-rigid comfortable foam shoulder pads comprising a first and second paid;

first pocket means for completely enclosing the first pad;

second pocket means for completely enclosing the second pad;

said pocket means comprising at least an upper pocket panel and a lower pocket panel;

said upper pocket panel and said lower pocket panel stitched together to completely enclose said pads;

back panel means for connecting between said pocket means across the wearer's back behind the wearer's neck, said back panel means comprising an upper panel and a lower panel joined by seams at its front and back edges; said back panel further comprising a pair of ends;

strap means depending from the assembly for extending beneath the wearer's armpits and securing the assembly to the wearer independently of the pressure of any other garment;

all panels comprising soft non-rigid fabric means, of sufficient comfort when worn adjacent skin, and of appropriate asthetics, to comprise means for being worn as underwear;

said strap means comprising elastic material;

means for adjusting the lengths of the strap means, said adjustment means comprising:

a buckle, and

an O-ring;

stitching means for joining each of said back panel's ends to respective pad pocket means, and for attaching one end of the ends of each strap means to the assembly, and for joining the upper and lower pocket panels; and

a second stitching means for joining all the upper panels to their respective lower panels at said panels' backs, and for completing enclosure of the pads, and for joining another end of each strap means to the assembly.

5,068,925
FOOT FLUSH ADAPTOR
S. Kamal Salibi, 6273 Kipap Rd., Kapaa, Hi. 96746
Filed Sep. 19, 1990, Ser. No. 585,810
Int. Cl.[5] E03D *5/08*
U.S. Cl. 4—249 **15 Claims**

1. A device for adapting a hand actuation means of a latrine flushing mechanism to be actuated from a location on a surface remote therefrom, which comprises:

an adaptor means coupled to said actuation means and responsive to an actuation force for causing actuation of said actuation means;

a connecting means coupled to said adaptor means and responsive to oscillation for applying said actuation force to said adaptor means to actuate said actuation means;

a lever member coupled to said connecting means for oscillating said connecting means, said lever member comprising a straight portion of tubing having a tube of substantially smaller diameter and length affixed to an end thereof, said lever member having a substantially flat, rectangular plate having the flat portion thereof affixed to an end opposite of said smaller diameter tube, said plate forming a substantially acute angle with said portion of tubing; and

a mounting means coupled to the smaller diameter tube affixed to said lever member for pivotally mounting said lever member to said remote surface, said mounting means comprising a substantially flat, rectangular mounting plate having a width substantially equal to the length of said smaller diameter tube, said mounting means including a pair of substantially flat, rectangular end plates affixed to the longest edges of said mounting plate, each end plate having an opening located at a centermost region thereof for pivotally affixing said lever member thereto, said mounting means having a torsion spring affixed between said smaller diameter tube and said end plates, said spring having an arced portion for exerting an upward force on the bottom portion of said lever member.

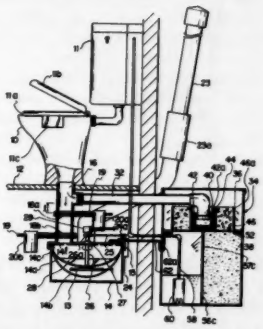
5,068,926
FLUSH TOILET
Kaneyuki Suzuki, 4726-5, Ooaza Nagakura, Karuizawa-machi, Kitasaku-gun, Nagano-ken, Japan
Filed Feb. 2, 1990, Ser. No. 474,337
Claims priority, application Japan, Feb. 10, 1989, 1-32493
Int. Cl.[5] E03D *5/016;* **A47K** *11/02*
U.S. Cl. 4—318 **8 Claims**

5. A flush toilet comprising:

an incinerating pot having a heater therein for incinerating solid waste, said incinerating pot being arranged below a toilet stool;

a drain pipe having a first end and a second end and extending a predetermined length and connecting said incinerating pot and said toilet stool;

a first shutter arranged across said drain pipe downstream of said toilet stool and approximately midway along the length of said drain pipe, said first shutter selectively opens said drain pipe during solid waste disposal and closes after completing solid waste disposal;



a second shutter arranged downstream of said first shutter along the length of said drain pipe, said second shutter selectively closes said drain pipe while said first shutter opens said drain pipe and selectively opens said drain pipe when said first shutter closes said drain pipe; and

a branch pipe attached to said drain pipe and arranged above said first shutter for permitting removal of flushed water separately from, and after the disposal of the solid waste.

5,068,927
REPLACEMENT SEAT FOR SANITARY CHAIRS
Bruno A. Massaro, 1534 Dunbar Hill Rd., Hamden, Conn. 06514, assignor to Bruno A. Massaro; Thomas Tolisano, both of Hamden and Hank Bolden, New Haven, all of, Conn.
Filed Aug. 16, 1990, Ser. No. 568,206
Int. Cl.[5] A47K *11/00*
U.S. Cl. 4—480 **17 Claims**

1. A replacement seat for a chair for immobile or substantially immobile persons having a frame member which comprises:

an integrally molded backrest and seat member of substantially rigid construction adapted to retrofit said frame member, said seat member comprises a seat platform, a toilet seat integrally molded to the seat platform and raised therefrom wherein said toilet seat has a substantially central toilet opening extending downward through said seat platform; and

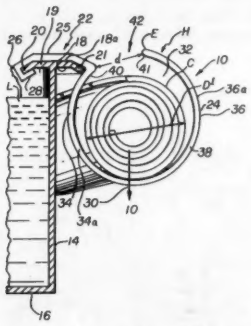
means for removably securing said integrally molded back rest and seat member to said frame member.

5,068,928

POOL COVER STORAGE APPARATUS

Cynthia Powell, 2515 Willard, Saginaw, Mich. 48602

Filed Jul. 30, 1990, Ser. No. 559,821
Int. Cl.[5] E04H *3/19*
U.S. Cl. 4—500 **10 Claims**



1. Apparatus for storing a rolled pool cover which is removed from a position covering a swimming pool having a perimetrically extending side wall to a position along a exterior side of said side wall, said side wall including an upper terminal end having inner and outer edge portions, said apparatus including:

a plurality of perimetrically spaced apart pool cover storage hooks for receiving perimetrically spaced portions of said pool cover when said cover is removed from said pool, each of said hooks including

a generally u-shaped, upwardly opening cover receiving portion, defining a cover receiving window, including

upstanding inner and outer legs having lower ends spanned by an integral base and upper ends which are spaced apart to provide an upwardly opening receptacle for freely receiving a portion of said pool storage cover; and

an inner mounting portion having an outer end coupled to said upper end of said inner leg for cantileverly mounting said u-shaped cover receiving portion on the exterior side of said exterior pool wall;

said inner mounting portion including an inner terminal portion bent upon itself for coupling to said inner edge portion of said upper terminal end of said pool side wall.

5,068,929

EDGE RETAINER FOR A FLOATING POOL COVER

Robert I. Weiner, 305 W. Chesapeake Ave., Towson, Md. 21520

Filed Feb. 25, 1991, Ser. No. 659,673
Int. Cl.[5] E04H *4/00;* **A47H** *13/00*
U.S. Cl. 4—503 **3 Claims**

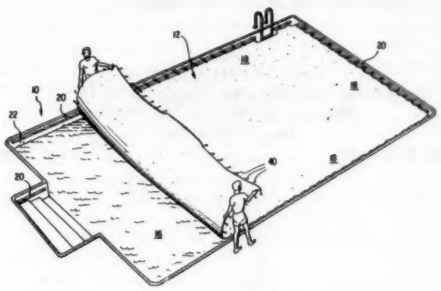
1. A swimming pool floating cover edge retainer comprising:

upwardly open channels adapted to be mounted on the side walls of a pool, to extend along substantially the entire perimeter of the pool directly above the pool's normal water level, each channel having an outer wall provided with notches at spaced intervals therealong;

means for affixing said channels to the side walls of the pool;

a plurality of anchors, each anchor having a base, a shank extending from said base and a bulbous end at the free end of said shank, the maximum diameter of said bulbous end being greater than the width of said channel outer wall notch; and

means for securing each said anchor to the edge of a floating cover with said shank and said bulbous end projecting laterally therefrom, said anchors adapted to be located on the cover at the same intervals as said notches; whereby the floating cover is retained over the water level in the



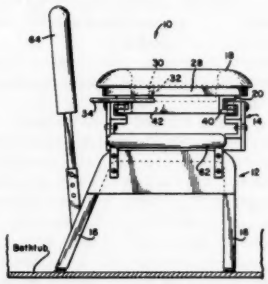
pool by inserting said anchors through the respective corresponding notches in said channel.

5,068,930

INVALID'S BATHTUB SEAT

Joseph Ruggiero, 509 E. Broadway, Port Jefferson, N.Y. 11777

Filed Jun. 25, 1990, Ser. No. 542,540
Int. Cl.[5] A47K *3/02*
U.S. Cl. 4—560 **7 Claims**



1. An invalid's bathtub seat, comprising:

a frame having (a) a platform, and (b) limbs, for supporting said platform within a bathtub, attached to said platform;

a seat, coupled to said platform, and journalled thereon for universal rotation;

said seat having a fully open central aperture; and wherein

said frame has a reciprocable track, to which said seat is coupled, and upon which said seat is rotatably journalled, as aforesaid;

said track comprising means for accommodating horizontal movement of said seat relative to said platform.

5,068,931

APPARATUS FOR LIFTING AND TURNING A PATIENT CONFINED TO A BED

Gene A. Smith, P.O. Box 179, Shallotte, N.C. 28459

Filed Jun. 21, 1991, Ser. No. 718,971
Int. Cl.[5] A61G *7/10*
U.S. Cl. 5—84 **14 Claims**

1. An invalid patient lifting and turning apparatus, comprising:

(a) an open framework for being positioned above a bed;

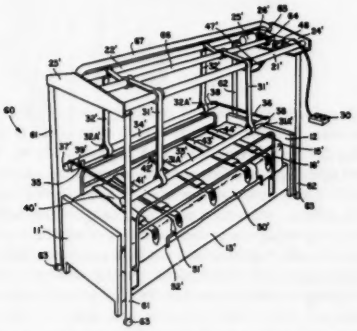
(b) elevator means supported by said open framework, said elevator means including a motor and a winding bar mounted on said framework and extending along the length of the framework for being rotationally driven by said motor;

(c) winding strap means connected to said winding bar and

to first and second spacing bars positioned on opposite sides of the framework;

(d) said strap means extending around said winding bar in a clockwise direction and in a counterclockwise direction whereby rotation of said motor in one direction winds said strap means onto said winding bar and rotation in the other direction unwinds said strap means off of said winding bar and thereby lowers or raises said spacing bars;

(e) patient support means for being positioned on a mattress of the bed underneath the patient and remaining underneath the patient at all times, said support means comprising a plurality of spaced-apart, removable and replaceable



support strap means secured by opposite ends to said spacing bars and extending laterally from side-to-side along the length of the patient for supporting the patient's head, trunk and legs thereby permitting the strap means to lift the patient above the mattress surface for cleaning and bed-linen changing; and

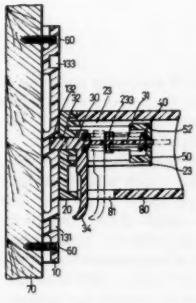
(f) patient turning means for being connected to said elevator means for turning the patient from side-to-side in the bed, said patient turning means including sheet attachment means for being attached to a draw sheet extending under the patient and for being pulled diagonally laterally across the bed from one side towards the opposite side of the bed by said winding strap means.

5,068,932

BABY CRIB WITH SLIDABLY LOCKABLE FENCE MEMBER

Jack Chang, No. 179, Pu Tzepu, Wanchas Tsuen, Chu-Chee Hsiang, Chiavi Hsien, Taiwan

Filed May 18, 1990, Ser. No. 525,784
Int. Cl.[5] A47D *7/02*
U.S. Cl. 5—100 **2 Claims**



1. A baby crib comprising:

a frame body having a pair of upright support posts;

a fence member extending between said upright support posts and having a hollow frame with two ends;

a pair of mounting pieces mounted to said upright support posts so as to connect said fence member to said upright support posts, each of said mounting pieces having a flat plate member formed with a plurality of spaced engaging slots and a pair of first slide rails;

a pair of slide bodies attached to said two ends of said hollow frame, each of said slide bodies having a slide portion slidably abutting one of said mounting pieces, said slide portion of each of said slide bodies having a through hole to be selectively aligned with one of said engaging slots and a pair of second slide rails comprising grooves slidably engaging said first slide rails, each of said slide bodies including a housing portion projecting from said slide portion into one of said two ends of said hollow frame, said housing portion of each of said slide bodies having a detachably attached cover piece opposite said slide portion, said cover piece having a guide hole, each of said engaging members having a second end opposite said first end which extends through said guide hole;

a pair of engaging members, each of said engaging members being movably mounted inside said housing portion of one of said slide bodies, each of said engaging members having a first end moved through said through hole of said slide portion of one of said slide bodies between an engaging position in which said first end engages one of said engaging slots and a releasing position, and a laterally projecting handle portion extending out of said hollow frame through said housing portion; and

a pair of biasing means, each of said biasing means being mounted in said housing portion of one of said slide bodies and urging said first end of said engaging member into said engaging position;

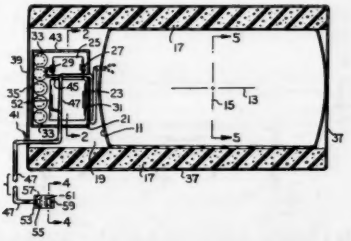
whereby, the height of said fence member relative to said upright support posts can be adjusted by operating said handle portion of each of said engaging members to change the position of said engaging members relative to said mounting pieces.

5,068,933

AIR COMFORT PILLOW

Eugene D. Sexton, 4434 S. Highway 67 N., Sycamore, Ohio 44882

Filed Nov. 7, 1990, Ser. No. 610,016
Int. Cl.[5] A47C *20/02*
U.S. Cl. 5—441 **7 Claims**



1. A sleeping pillow comprising an air-inflatible bag having a longitudinal axis and a transverse axis; an annular cushioner sleeve extending longitudinally along said bag in encircling relation thereto; said cushioner sleeve being longer than the longitudinal dimension of the bag whereby a pocket is formed within the sleeve adjacent one end of the bag; a pillow case enveloping said cushioner sleeve; a compressed air source located within said pocket in pneumatic connection with the bag; and manual means for controlling the compressed air source and air exhaust means, to thereby control bag pressure; said compressed air source comprising a mechanical air com-

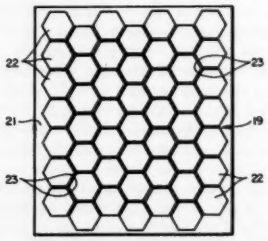
pressor that includes a compressor component and an electric drive motor connected thereto within said pocket.

5,068,934

WATERBED MATTRESS WITH HEXAGONAL POLYPROPYLENE BAFFLE STRUCTURES

John B. Johenning, Beverly Hills, Calif., assignor to Strata Flotation, Inc., Torrance, Calif.

Filed Aug. 18, 1989, Ser. No. 395,714
Int. Cl.[5] A47C *27/08*
U.S. Cl. 5—450 **14 Claims**



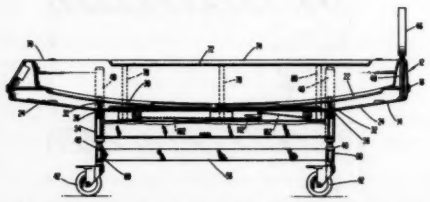
1. In a waterbed mattress: an enclosure for holding a body of water, a buoyant pad of polypropylene foam adapted to float within the enclosure, and a plurality of hexagonal cells having side and bottom walls of polypropylene depending from the buoyant pad, the polypropylene in at least the lower portions of the cells having a density greater than that of water so that the cells hang from the pad with the side walls in an extended condition when the enclosure is filled with water.

5,068,935

FLOTATION THERAPY BED HAVING TWO PART CONSTRUCTION

Mark Hagopian, Indian Rocks Beach, Fla., assignor to Biologics, Inc., St. Petersburg, Fla.

Filed Mar. 21, 1991, Ser. No. 672,730
Int. Cl.[5] A47C *27/08*; A61G *7/057*
U.S. Cl. 5—451 **10 Claims**



1. In a flotation therapy bed in which a patient is supported on a fluid containing bladder to thereby avoid decubitus ulcers, the improvement comprising:

an upper shell having a downwardly bowed bottom wall;

a lower shell having a substantially flat bottom wall;

an opening formed in .said bottom wall of said lower shell, centrally thereof;

said upper shell having a predetermined depth greater than a predetermined depth of said lower shell; and

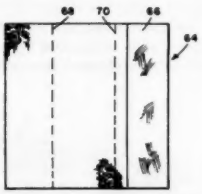
said bowed bottom wall of said upper shell being at least partially received within said opening of said lower shell when said bed is assembled.

5,068,936

DISPOSABLE ARTICLE OF BEDDING

Gene Blitzer, 96 High Dr., P.O. Box 114, Monroe, Conn. 06468

Continuation of Ser. No. 892,202, Aug. 4, 1986, abandoned. This application Jan. 29, 1990, Ser. No. 472,729
Int. Cl.[5] A47G *9/04*; B32B *23/02*
U.S. Cl. 5—487 **1 Claim**



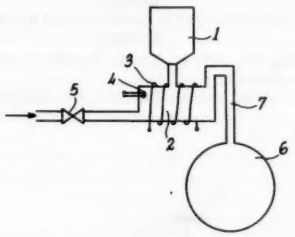
1. A disposable article of bedding comprising a piece of non-woven foldable material which when flat is generally rectangular and having first and second surfaces, first and second side edges and first and second end edges and a coating of mildly sticky material deposited on and adhered only to said second surface, wherein a portion of said second surface is in overlapping engagement with a portion of said first surface and is held in such engagement by a first portion of said coating which engages said first surface, and an additional portion of said coating is not in overlapping engagement with said first surface, and said article is a pillow case open at both ends, and wherein said coating is limited to first and second rectangular areas of said second surface adjacent opposite edges thereof.

5,068,937

DEVICE FOR THE ACTIVATION OF PERBORATE IN WASHING MACHINES

Stefano Meloni, and Carlo Rossi, both of Fabriano, Italy, assignors to Enea - Comitato Nazionale per la Ricerca e per lo Sviluppo Dell'Energia Nucleare e Delle Energie Alternative, Fabriano, Italy

Filed Jul. 21, 1989, Ser. No. 382,756
Claims priority, application Italy, Jul. 28, 1988, 48242 A/88
Int. Cl.[5] D06F *39/02*
U.S. Cl. 8—158 **23 Claims**



23. A method of supplying perborate to washing machines and for activating the perborate to produce hydrogen peroxide which is effective to bleach fibers in washing machines, said method including the following steps:

introducing perborate into a cup; supplying water to the cup via a conduit which is arranged upstream of said cup to cause the perborate to become dissolved in the water; providing a washing tub containing liquid at a temperature which is insufficient to activate perborate; heating the water up to a temperature which is sufficient to the cause perborate to become activated and is higher than the temperature of liquid in the washing tub; controlling said heating until the temperature required for activating perborate is obtained; and, connecting the cup to the washing

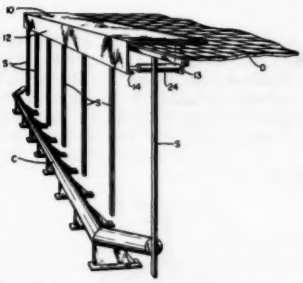
tub of the washing machine via a conduit which is arranged downstream of said cup.

5,068,938

SELF-LEVELING PLATFORM FOR LOADING DOCKS

Frederick Roscoe, 22 S. Newland Ct., Lakewood, Colo. 80226

Filed Sep. 13, 1990, Ser. No. 581,899
Int. Cl.[5] E01D *15/00*
U.S. Cl. 14—71.7 20 Claims



1. A movable loading platform apparatus for an elevated loading dock in loading and unloading cargo onto and from a cargo-receiving receptacle alongside a front end of said dock, said apparatus comprising:

a horizontal panel having a front end and a back end;

panel support means for slidably supporting said panel on said dock for extension and retraction toward and away from said receptacle; and

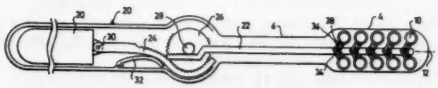
activating means for extending said panel toward the receptacle such that said front end of said panel is disposed in closely spaced, parallel relation to one side of said receptacle notwithstanding any misalignment between said one side of said receptacle and said front end of said dock, said activating means being pivotally connected to horizontally spaced locations on said front end of said panel for differential pivotal movement of said panel in a horizontal plane in moving into parallel relation to said one side of said receptacle.

5,068,939

BRUSH CONSTRUCTION INCLUDING MOVABLY-MOUNTED BRISTLES

Neta Holland, Herzlia, Israel, assignor to Ohad Paz, Tel-Aviv, Israel

Filed Dec. 27, 1989, Ser. No. 457,904
Int. Cl.[5] A46B *13/08, 7/08*
U.S. Cl. 15—22.1 19 Claims



1. A brush, comprising:

a handle at one end, and a brush head at the opposite end;

a plurality of bristle holders each rotatably mounted in the brush head about its own rotary axis;

a plurality of crank arms each coupled to one of said bristle holders for oscillating it about its respective rotary axis;

each of said crank arms being formed with an elongated slot;

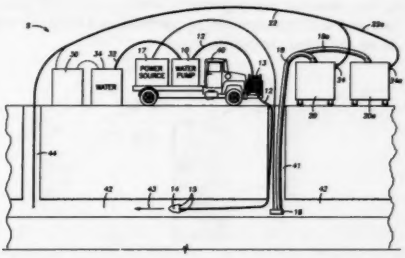
and a member mounted in said handle, said member mounted for reciprocable movement with respect to said brush head and carrying a plurality of pins each received in the slot of one of said crank arms to oscillate the respective bristle holder about its rotary axis upon the reciprocation of said member.

5,068,940

APPARATUS FOR CLEANING SEWERS

Sheron R. Sheppard, Humble, and Henry B. Polston, Pasadena, both of Tex., assignors to Ray Harvey Company, Inc., Noblesville, Ind.

Filed Nov. 1, 1990, Ser. No. 608,067
Int. Cl.[5] A47L *5/16*
U.S. Cl. 15—104.31 16 Claims



1. An apparatus for cleaning sewers of solid material by suspending the material in a water slurry and pumping the slurry to a waste container were the solids separate from the water and drop to the bottom of the container and the decanted water is reused for cleaning the sewer, comprising:

a source of high pressure water;

a water hose having first and second ends, said hose first end being in communication with said high pressure water source;

a cleaning head adapted to be positioned in a sewer and having front and back faces, said back face adapted for connection to said water hose second end and having a plurality of water jet outlets for directing high pressure water into and cleaning a sewer and suspending sewer pipe solid material in a slurry in the water and moving said cleaning head upstream;

a submersible pump adapted for pumping a slurry comprised of liquids and solids from the sewer and located downstream of said cleaning head, said pump adapted to be powered from a remotely located power source;

a positive pressure waste container;

a slurry hose having first and second ends, said slurry hose first end in communication with said waste container and said second end in communication with said submersible pump for transmitting the pumped slurry to the waste container;

a decant water outlet in said waste container; and

a decant water hose having said waste container water decant outlet and said second end in communication with the sewer upstream of said submersible pump.

5,068,941

FINGER-MOUNTED TOOTHBRUSH

Gary D. Dunn, P.O. Box 1115, Palm Harbor, Fla. 34582

Filed Jul. 14, 1989, Ser. No. 380,049
Int. Cl.[5] A46B *5/04*
U.S. Cl. 15—167.1 2 Claims

1. A flexible toothbrush, comprising:

an elongate flexible bag member having a closed distal end, an open proximal end, and a cylindrical medial part therebetween;

all of said parts being formed of a common thin material and said bag member being of unitary, one-piece construction;

said cylindrical medial part having a distal part and a proximal part;

a plurality of truncate bristle members secured in upstanding

relation relative to preselected outer surfaces of said distal part of said cylindrical medial part;

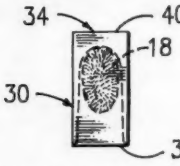
closure means for releasably closing said proximal end;

said bag member, when unfolded and deployed into an operative configuration, having a longitudinal extent substantially equal to the longitudinal extent of a human finger;

said bag member, when unfolded and deployed into an operative configuration, having a diameter substantially equal to the diameter of a human finger;

said bag member being partially folded inside-out when in a stored condition, said folding resulting in the formation of a return bend;

said bag member being partially folded inside-out prior to use and said bag member being discarded after use when in its unfolded condition;



said open proximal end extending distally beyond said closed distal end only when said bag member is folded so that said distal end is covered and kept sterile when the bag member is stored;

said open proximal end being closed only when said bag member is folded;

said bristle members being covered by said proximal part of said cylindrical medial part only when said bag member is partially folded inside-out;

said bag member having a substantially flat configuration when in its stored condition;

said bag member being formed of a non-resilient material so that it remains in its flat configuration when stored;

whereby cleanliness of said bristle members is maintained until said closure means is released and said bag member is unfolded to expose said bristle members.

5,068,942

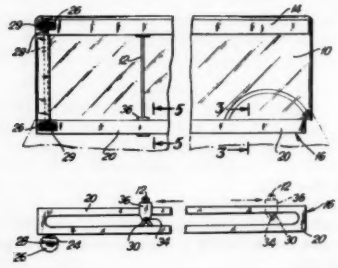
WINDSHIELD WIPER ASSEMBLY

Socrates Vrettos, Arhiginous Saranti 12, 544 53, Thessaloniki, Greece

Continuation-in-part of Ser. No. 185,505, Apr. 25, 1988, abandoned. This application Aug. 23, 1989, Ser. No. 397,263

Int. Cl.[5] B60S *1/26, 1/18*

U.S. Cl. 15—250.24 **3 Claims**



1. A windshield wiper assembly comprising an endless belt adapted to be positioned beneath a windshield, the belt extending substantially the length of the windshield, said belt being movably mounted within and supported by a sleeve conforming in size and shape to the belt, a wiper mounting attached to the innerside of the belt through a slotted opening in the innerside of said sleeve, said sleeve innerside defining a space large enough to accommodate said mounting, said mounting extending into said space and being rotatable about a wiper blade to be supported by it, and a drive for continuously rotating the belt only in one direction to cause a wiper blade held by the mounting to rapidly move back and forth across the entire windshield, said drive comprising a sprocket positioned exteriorly of the belt and sleeve, said belt being slotted for engaging the sprocket through an opening in the outerside of said sleeve.

5,068,943

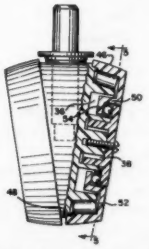
DUAL WHEEL TILTED AXLE CASTER WITH AN INTEGRAL RETAINER AND BEARING ASSEMBLY

Michael H. Estkowski, St. Joseph; Christopher G. Estkowski, Coloma, and Michael Gaishin, St. Joseph, all of Mich., assignors to Shepherd Products U.S., Inc., St. Joseph, Mich.

Filed Dec. 27, 1990, Ser. No. 634,443

Int. Cl.[5] B60B *33/00*

U.S. Cl. 16—18 A **6 Claims**



1. A dual wheel tilted axle caster assembly including a body having an upper end and a lower end, said body defining a pair of angularly inclined side walls which converge toward each other at said lower end of said body; a first cylindrical sleeve coaxial with and extending outwardly from each side wall generally perpendicular thereto; a second cylindrical sleeve coaxial with and extending outwardly from each side wall, said second cylindrical sleeve spaced radially outwardly from said first cylindrical sleeve and defining an annular chamber therebetween; a pair of wheels each adapted to engage and roll over a surface, each wheel mounted on said body so as to be relatively rotatable with respect to said body and said other wheel, each wheel including an inwardly extending rim, the outer surface of which provides a ground engaging surface, said rim overlying said second cylindrical sleeve; a first bearing assembly disposed between said rim and said second cylindrical sleeve for rotatably supporting said wheels on said body; means to secure said wheels to said body but to permit relative rotation therebetween.

5,068,944

CONTAINER WITH A CARRYING HANDLE

Hans Knürr, Kirchheim, Fed. Rep. of Germany, assignor to Knurr-Mechanik fur die Elektronik Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 11, 1990, Ser. No. 550,760

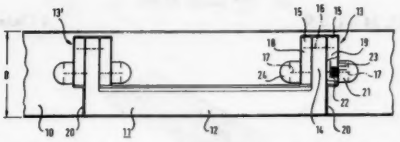
Claims priority, application Fed. Rep. of Germany, Jul. 24, 1989, 3924450

Int. Cl.[5] B65D *25/00;* **E05B** *5/00*

U.S. Cl. 16—112 **11 Claims**

1. A dimensionally rigid container having an outer wall with a length dimension including a longitudinal centerline and a width dimension, and a handle structure mounted on said wall for carrying the container, the handle structure comprising an elongated handle grip with terminal legs, and links pivotally connected to the respective legs about a first pivot axis, the links being pivotally connected to said wall about a second pivot axis parallel to the first pivot axis, said pivot axes being

parallel to the longitudinal centerline of said wall and parallel to the handle grip, the handle structure being configured for folding into an inoperative position substantially flat against a surface of said wall with the links extending from said second pivot axis towards but not beyond one longitudinal edge of said



wall and with the legs extending adjacent the links from said first pivot axis through said second pivot axis towards but not beyond an opposite longitudinal edge of said wall, the handle structure being unfoldable away from said wall to an extended container-carrying position.

5,068,945

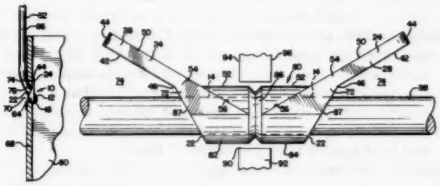
FASTENER

Richard S. Hart, Elgin, and Thomas E. Perdue, Jr., Crystal Lake, both of Ill., assignors to Duraco Products, Inc., Streamwood, Ill.

Filed Jul. 2, 1990, Ser. No. 547,055

Int. Cl.[5] B65D *77/10*

U.S. Cl. 16—114 B **7 Claims**



1. A fastener comprising:

a body,

an inner passageway extending between a first end and a second end of said body, said second end defined in part by an end wall positioned on an angle to extend upward and outward, said inner passageway extending through said end wall, and

an ear joined to said body above said second end with said ear positioned on an angle to project upward and outward therefrom,

wherein during a use of said fastener a cord section is secured in said passageway of said fastener, and said securing fastener then is inserted through an opening in a structural member to connect said cord section to said member by said fastener ear forming an interference fit with said member.

5,068,946

LOCKING HINGE ASSEMBLY FOR AN AIRCRAFT COWLING

Jean-Marc D. L. Marescot, and Pascal-Marie P. M. Soulier, both of Le Havre, France, assignors to Societe anonyme dite Hispano-Suiza, Saint-Cloud, France

Filed May 22, 1990, Ser. No. 526,723

Claims priority, application France, Jun. 7, 1989, 89 07516

Int. Cl.[5] E05D *11/10*

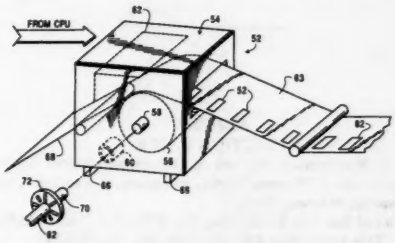
U.S. Cl. 16—333 **29 Claims**

1. A locking hinge assembly for pivotally attaching a movable member to a stationary member such that the movable member is movable between closed and open positions comprising:

a) a stationary fitting member associated with the stationary member;

b) a first link having a first end portion pivotally attached to the stationary fitting member so as to pivot about a first pivot axis, and a second end;

c) a pair of second links, each second link having a first end portion pivotally attached to the stationary fitting member so as to pivot about a second pivot axis displaced from the first pivot axis, and a second end, wherein one second link is disposed on each side of the first link;



d) means pivotally attaching the second ends of the first and the pair of second links to the movable member so as to pivot about third and fourth pivot axes, respectively, the links, the movable member and the stationary fitting forming a quadrilateral with the four pivot axes as apices; and,

e) locking means operatively associated with the stationary fitting member and at least one of the links to lock the assembly in the closed position wherein the locking means comprises a hook member movably supported on the stationary fitting member.

5,068,947

SEPARATION APPARATUS

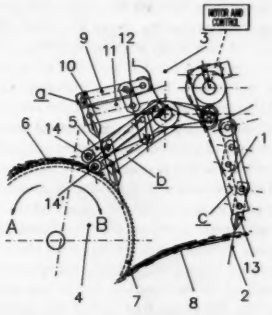
Alfred Beeler, Horgen, Switzerland, assignor to Siegfried Peyer AG, Wollerau, Switzerland

Filed Aug. 16, 1990, Ser. No. 568,044

Claims priority, application Switzerland, Aug. 29, 1989, 135/89

Int. Cl.[5] D01G *15/50, 19/00*

U.S. Cl. 19—106 A **10 Claims**



1. A separation apparatus for separating a fiber web (**6**) wound on a rotatable processing drum having a plurality of rows of garnett elements extending from the surface thereof along circumferential circles lying in planes perpendicular to the rotation axis of the drum, the rows of elements being axially spaced apart, the web having a free end and parallelized fiber positions, the apparatus comprising the combination of

a rocker arm (**1**) carrying a separation comb (**13**);

a separation cam (**3**) having a cam control surface;

means for mounting said rocker arm for movement along

said control surface of said separation cam (3) to control the movement of said arm and said comb toward and away from said surface of said drum thereby to engage the free end of the fiber web (6) at a specific site on said drum surface between said rows of garnett elements and to separate and unwind the separated fiber web from the processing drum (4) along a generatrix of the processing drum (4).

5,068,948

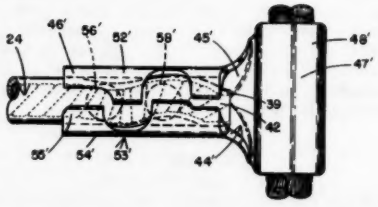
TRACTION CABLE

David J. Blankenship; Richard A. George, and Steven E. Czaplewski, all of Winona, Minn., assignors to Peerless Chain Company, Winona, Minn.

Division of Ser. No. 96,641, Sep. 11, 1987, Pat. No. 4,825,923. This application Jan. 30, 1989, Ser. No. 303,247

Int. Cl.[5] A44B *1/04*

U.S. Cl. 24—115 A **4 Claims**



1. A side cable clip transversely interconnecting members of a traction cable, said traction cable including a pair of elongated, flexible side member having first and second ends, and a plurality of elongated, flexible cross members having ends which are interconnected to said side members, said side cable clip comprising a body portion including first and second ends, and upper and lower surfaces, first and second sides having a plurality of recesses, and at least two localized point projections; each projection extending above an adjacent portion of the upper surface of said body portion and being located in a position which is removed from at least one of said sides; each localized point projection having an elevated surface area which is raised above the upper surface of the remainder of the body portion when said clip is in an uncrimped conditions, the elevated surface area of each localized point projection including a top surface area which is raised above remaining portions of the elevated surface area which radiate continuously around the top surface area so as to generally localized the top surface area at a point proximate a center of the localized point projection; said recesses defining a plurality of displacement teeth; said first end of said body portion being crimped circumferentially around one of the end ends of one of the cross member members such that the respective end of the respective cross member is fixedly bound therein; said displacement teeth and said localized point projections cooperating to displace the respective cross member from a linear path within said first end of said body portion; said second end of said body portion being crimped circumferentially around one of the side member members and transversely to the respective cross member, such that the respective side member is fixedly bound therein; wherein the respective cross member is transversely connected to the respective side member which are thereby interconnected.

5,068,949

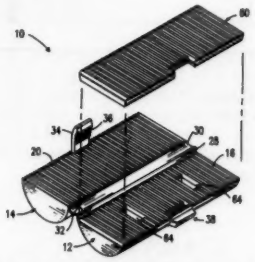
ROPE CONNECTOR HAVING QUICK ENGAGING AND RELEASING MEANS

Martin J. Horace, 2095 Sunset Point Rd., Clearwater, Fla. 34625

Filed Dec. 14, 1990, Ser. No. 628,283

Int. Cl.[5] A44B *21/00*

U.S. Cl. 24—115 R **4 Claims**



1. A clamp that holds ropes together, comprising:

a base member;

a closure member;

a hinge means hingedly interconnecting said base member and said closure member;

a latch means for holding said closure member in overlying relation to said base member;

a plurality of teeth members formed in said base member;

a plurality of teeth members formed in said closure member;

said respective teeth members formed in said base and closure members being disposed in confronting relation to one another when said closure member is disposed in overlying relation to said base member so that a rope sandwiched between said base and closure members is gripped along its extent by said respective teeth members and held against axial displacement thereby;

quick release means for disengaging said latch means;

said base and closure members being of elongate construction and having a substantially equal longitudinal extent;

said respective teeth members being formed transverse to the respective longitudinal extents of said base and closure members;

a toothed insert member of predetermined thickness disposed in overlying relation to said base member;

a vertical wall extending along a preselected longitudinal edge of said base member having sufficient height to cooperate with an associated wedge to grip a thin rope between said base and said closure member; and

said hinge means having a first longitudinally extending edge integral to a top edge of said vertical wall and a second longitudinally extending edge integral to a preselected longitudinally disposed external edge of said closure member.

5,068,950

PROVISIONAL PULL TAB FOR SLIDE FASTENER SLIDERS

Kenji Yuki, Toyama, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Mar. 30, 1990, Ser. No. 507,032

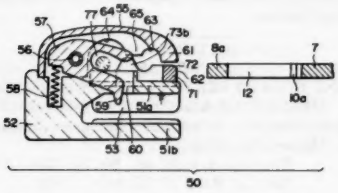
Claims priority, application Japan, Mar. 31, 1989, 1-83820

Int. Cl.[5] A44B *19/30*

U.S. Cl. 24—429 **8 Claims**

1. In a slider for slide fasteners including a slider body having a lug on its upper surface; a provisional pull tab releasably mounted on the slider body and comprising a grip portion adapted for being gripped and pulled for manipulation of the slider; a surrounding rim integrally extending from the grip portion and defining with a proximal end of the grip portion an aperture, through which the lug is inserted so that the provi-

sional pull tab is pivotally mounted on the lug; and a fragile portion disposed at least partially around the aperture to thus



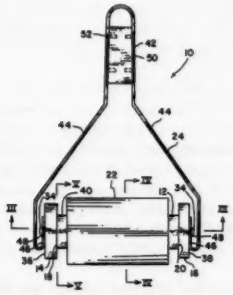
permit a breaking open of the aperture for detaching the provisional pull tab from the slider body.

5,068,951

DEVICE FOR APPLYING CONSTANT PRESSURE TO A SURFACE

Eve M. Abrams, Rockville, Md., assignor to The United State of America as represented by the Administrator, National & Space Administration, Washington, D.C.

Filed May 31, 1990, Ser. No. 531,374
Int. Cl.[5] B05C *17/02*
U.S. Cl. 29—110.5 **10 Claims**



1. A device for applying constant pressure to a surface, comprising:

a cylinder;

a first and second wheel means coupled to each end of said cylinder, said first and second wheel means having a diameter substantially greater than the diameter of said cylinder;

a compressible elastomeric covering surrounding said cylinder, said compressible elastomeric covering having an outer diameter substantially greater than said diameter of said first and second wheel means; and

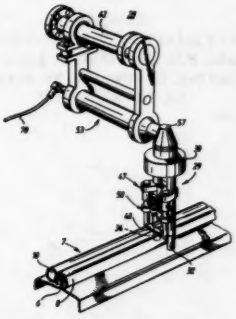
means for compressing said compressible elastomeric covering until said first and second wheel means contact said surface, said compressible elastomeric covering applying constant pressure to said surface independent of additional pressure exerted by a user after said first and second wheel means contact said surface.

5,068,952

APPARATUS FOR FITTING FLEXIBLE STRIPS

Heinz J. Hennen, Viersen, Fed. Rep. of Germany, assignor to Draftex Industries Limited, Edinburgh, Scotland

Filed Dec. 3, 1990, Ser. No. 621,606
Claims priority, application United Kingdom, Dec. 7, 1989, 8927677
Int. Cl.[5] B23P *21/00*
U.S. Cl. 29—235 **17 Claims**



1. A tool for fitting a length of channel-shaped strip onto a mounting flange or the like, comprising

a body portion carrying strip engaging means for engaging the outside surface of the strip when on the mounting flange and which includes roller means for contacting the said surface of the strip and applying pressure thereto,

motor means carried by the body portion for rotating the roller means and frictionally driving the tool along the length of the strip on the flange,

pressure-responsive means responsive to the magnitude of the pressure applied to the surface of the strip by the roller means for producing a warning indication when the pressure falls below a predetermined level, and

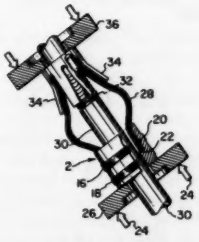
a safety barrier positioned to block access to the rotating roller means.

5,068,953

HOSE FITTING REMOVAL APPARATUS

Robert A. Semotiuk, 2633 Tweedsmuir Ave., Prince George, B.C., Canada V2N 1E8

Filed Sep. 12, 1990, Ser. No. 581,639
Int. Cl.[5] B23P *19/04*
U.S. Cl. 29—235 **10 Claims**



1. An apparatus for fitting on an end of a hose to enable a finger fitting at an opposite end of the hose to be loosened by forcing the apparatus in the direction of the fitting and enlarging the hose comprising a hollow cylinder open at a first axial end and a second axial end, the opening at the first end being circular and of a diameter greater than the diameter of the opening at the second end, the second end with the narrower diameter opening being planar in a radial direction, the interior

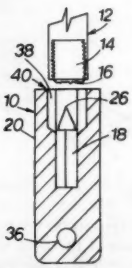
of the cylinder having an annular ledge adjacent to and contiguous with the opening of smaller diameter at the second end, the ledge being angled radially inwardly to the axial centre and in the direction of the first end of the hollow cylinder having the greater diameter opening, and the cylindrical walls of the interior of the greater diameter portion of the hollow cylinder between the ledge and the first end being tapered diametrically outwardly from the outer diameter of the ledge to the inner diameter of the greater opening of the first end of the hollow cylinder.

5,068,954

DART SHAFT EXTRACTION TOOL

Robert L. Houska, P.O. Box 20161, St. Louis, Mo. 63123

Filed Sep. 12, 1990, Ser. No. 581,036
Int. Cl.[5] B23P *19/06*
U.S. Cl. 29—240 **20 Claims**



1. A dart shaft extraction tool, comprising:

receiving means for receiving a portion of a dart assembly containing a broken shaft portion to be extracted from the dart barrel, the receiving means defining a dart assembly receiving bore;

securing means for securing the broken shaft portion remaining in a dart barrel relative to the extraction tool, the dart barrel received by the dart assembly receiving bore defined by the receiving means, the securing means located within the dart assembly receiving bore defined by the receiving means; and

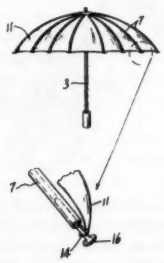
holding means for holding the securing means while the tool is rotated and the shaft portion extracted from the barrel.

5,068,955

METHOD FOR REPAIRING BROKEN UMBRELLAS

Helen F. Gonet, 42 Cliff St., Norwich, Conn. 06460

Continuation-in-part of Ser. No. 144,037, Jan. 15, 1988, abandoned. This application Feb. 6, 1989, Ser. No. 306,570
Int. Cl.[5] A45B *11/00*
U.S. Cl. 29—402.09 **3 Claims**



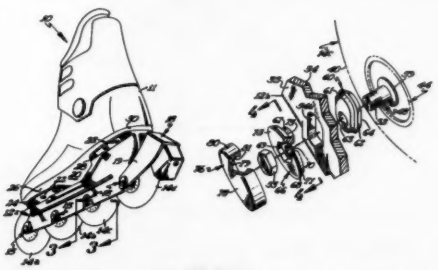
1. A method of repairing an umbrella with the aid of a kit of solid end pins, each having a smooth shank with an end tip at one end, said method comprising the steps of withdrawing a said end pin from a supply of end pins provided by the kit and inserting the shank of said withdrawn end pin through the cover of the umbrella or an attaching loop and into a hollow rib of the umbrella, which rib is in need of repair, and passing the shank into interference engagement with the rib into which it is being inserted.

5,068,956

IN-LINE ROLLER SKATE FASTENING SYSTEM AND METHOD OF ASSEMBLING THE SAME

Andrzej M. Malewicz, Minnetonka, Minn., assignor to Rollerblade, Minnetonka, Minn.

Filed Jul. 3, 1990, Ser. No. 547,236
Int. Cl.[5] B23P *11/00*; A63C *17/06*
U.S. Cl. 29—437 **37 Claims**



1. A fastening system for attaching a wheel to an in-line roller skate, said in-line roller skate having a frame including first and second side rails each having a predetermined thickness t, said side rails being provided for mounting therebetween at least one wheel having a wheel axle bore and each said rail having an axle aperture, said first aperture having a substantially eccentric configuration, said fastening system comprising:

a wheel axle comprising a bolt having a shaft and having a bolt head at one end of said shaft configured to receive a fastening tool means and a threaded bolt end disposed at the other end of said shaft, said wheel axle being received within said wheel axle bore and rotatably mounting said wheel;

a fastening plug including a collar and a lug, said lug configured for mateable reception by said eccentric axle aperture in said first side rail, said lug being inserted into said eccentric axle aperture from a first direction, said collar extending radially outward from said lug to bear against said first side rail, said lug having a thickness t_{lug} that is less than said thickness t, said plug including an axle bore configured to receive said wheel axle shaft; and

a snap cover assembly, said assembly including:

a nut;

an anchor including an anchor rim and an anchor lug, said anchor lug configured for mateable reception by said eccentric axle aperture in said first side rail, said anchor lug being inserted into said aperture from a second direction opposite to said first direction, said anchor lug having a thickness t_{anchor} that is less than said thickness t, said anchor rim defined in part by an inner surface for bearing against said first side rail, an outer surface of said anchor including a central receptacle configured to receive said nut and prevent rotation thereof, and at least one outer side surface extending between said inner surface and said outer surface, said anchor including an anchor axle bore coaxial with said central receptacle for receiving said axle; and

a snap cover adapted to be yieldably snap fitted to said anchor rim to cover said nut when said nut is received in said central receptacle, said snap cover comprising a top portion and a peripheral snap cover rim integral with said

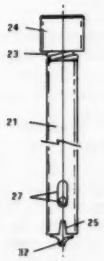
top portion, said snap cover rim extending to overlie said anchor rim and having an internal snap fit groove defined therein for receiving and engaging said anchor rim.

5,068,957

TURNING VANE SETTING TOOL

Raymond M. Felson, 56 Rugby Place, Montreal West, Quebec H4X 1C4, Canada

Filed Dec. 7, 1990, Ser. No. 623,764
Claims priority, application Canada, Sep. 25, 1990, 2026100
Int. Cl.[5] B21D *28/00*
U.S. Cl. 29—566 **1 Claim**



1. A tool for installing air turning vanes in air turning vane rails or runners having circular or near circular embossed depressions with slots thereacross that receive an end of the air turning vane, said tool comprising a cutting shaft having a cutting and deforming chisel edge at a first edge at a first end thereof, said shaft being received for linear movement in a cylindrical or near cylindrical casing which conforms and fits into the circular or near circular depressions of the vane rail or runner, said casing and shaft having cooperating means insuring said linear movement, said casing having a first end with diametrically opposed notches therein that receive the vane edge for positioning, said chisel edge being disposed at an acute angle relative to the diameter or to the major axis that said notches lie upon; said shaft having a second end extending out of the second end of said cylindrical or near cylindrical casing so that the chisel edge of said shaft may be driven into a vane edge to form tabs that lock said vane to said rail or runner.

5,068,958

METHOD AND APPARATUS FOR CHANGING TOOLS IN AN AUTOMATED MACHINE TOOL

Wojciech Kosmowski, San Juan Capistrano, Calif., assignor to Dynamotion Corporation, Santa Ana, Calif.

Filed Sep. 18, 1990, Ser. No. 584,807
Int. Cl.[5] B23Q *3/157*
U.S. Cl. 29—568 **25 Claims**

1. A method of inserting a first end of an elongated tool of unknown length into a working unit so that a predetermined length of the tool extends from the unit, comprising a sequence of the following steps:

(i) gripping the tool in a gripper device with a relatively high gripping pressure so that the first end of the tool extends from the gripper device, with a length of the tool received within the gripper device which is less than the predetermined length;

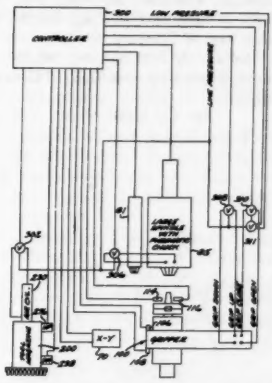
(ii) aligning the gripper device with the working unit;

(iii) effecting relative movement between the gripper device and the working unit to insert the first end of the tool into the working unit;

(iv) gripping the tool by the working unit and reducing the gripping pressure of the gripper device on the tool so that further relative movement of the gripper and the working unit causes sliding movement of the tool in the gripper device;

(v) effecting further relative movement between the gripper device and the working unit to reduce the distance therebetween while causing the tool to slide further within the gripper device until the length of the tool received within the gripper device is substantially equal to said predetermined length;

(vi) releasing the tool gripping by the working unit and increasing the gripping pressure of the gripper device; and



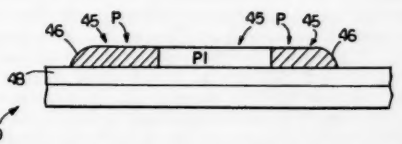
(vii) effecting further relative movement between the gripper device and the working unit to bring the gripper device and the working unit substantially adjacent each other to insert said tool into said working unit with said predetermined length extending from the working unit.

5,068,959

METHOD OF MANUFACTURING A THIN FILM HEAD

Alan L. Sidman, Wellesley, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 329,429, Mar. 28, 1989, abandoned, which is a continuation-in-part of Ser. No. 217,397, Jul. 11, 1988, abandoned. This application Sep. 11, 1990, Ser. No. 582,799
Int. Cl.[5] G11B *5/42*
U.S. Cl. 29—603 **22 Claims**



1. A method for forming a thin film head that comprises at least two poles separated by a gap section, the steps comprising:

(a) disposing a leveling material adjacent to and partially over an upper surface of a tip of a first of said poles, and curing the portion of said leveling material that is disposed partially over said upper surface to cause said portion of said leveling material that is disposed partially over said upper surface to flow to form, in conjunction with the portion of said leveling material that is disposed adjacent to said tip of said first of said poles, a planarizing layer adjacent to said tip of said first of the poles, the planarizing layer defining a uniform planar area comprised of an upper surface of the tip of the first of the poles and an upper surface of the planarizing layer,

(b) forming the gap section upon the uniform planar area, the gap section being coupled with the uniform planar area, and

(c) forming a tip of a second of the poles upon the gap

section, the tip of the second of the poles being coupled with the gap section, the second pole tip being equal in width to or wider than the tip of the first pole.

5,068,960

DEVICE FOR THE INSERTION OF FILLING WIRES INTO A WIRE JOINTED-BAND

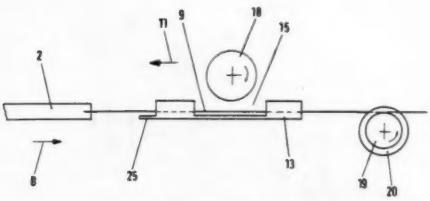
Friedrich Metzinger, Frankfurt am Main, Fed. Rep. of Germany, assignor to Filztuchverwaltungs GmbH, Morfel Den-Walldorf, Fed. Rep. of Germany

Filed Jan. 4, 1990, Ser. No. 460,752

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1989, 8902635[U]

Int. Cl.[5] B23P *19/04*

U.S. Cl. 29—779 **9 Claims**



1. A device (8) for the insertion of filling wires (9) into openings of a formed wire jointed-band, wherein said wire jointed-band is constructed of counter-current wound spirals which partly overlap each other being provided next to each other forming pairwise connection openings in which a plugging wire (5) is inserted wherein the filling wires extend parallel to the plugging wires in the wire jointed-band the device comprising a guiding plate (13) with front and rear ends and having a plurality of channels (14) forming orifices which are parallel to each other, said channels provided for guiding the filling wires (9), wherein the channels over a section (15) of the guiding plate (13) are freely accessible from above and below, and a conveyor roller (18) driven for rotation in the area of said section (15) acts upon the filling wires (9) in the channels (14) so as to transport said filling wires to said openings of the wire jointed-band (2) for insertion into said openings wherein furthermore at the side of said guiding plate (13) in the direction toward the wire jointed-band (2) are provided a plurality of slots (21) next to each other and freely accessible from above and provided for inserting and fixing the ends of the plugging wires (5) protruding over the wire jointed-band (2), said slots being arranged relative to the orifices of said channels such that upon fastening of the plugging wires (5) in said slots (21) the openings of the wire jointed-band (2) are aligned to the orifices (14) of said channels (14) to receive the filling wires therein.

5,068,961

METHOD OF MANUFACTURING ION FLOW RECORDING HEAD

Masaji Nishikawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 21, 1990, Ser. No. 616,337

Claims priority, application Japan, Nov. 28, 1989, 1-308476

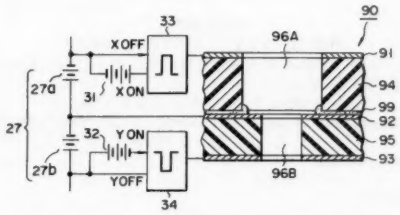
Int. Cl.[5] H01R *43/00*

U.S. Cl. 29—825 **8 Claims**

1. A method of manufacturing an ion flow recording head, comprising the steps of:

preparing a first member comprising a multilayered structure of a first electrode, a first insulating layer, and a second-A electrode, and having first ion flow passage holes;

preparing a second member comprising a multilayered structure of a second-B electrode, a second insulating layer, and a third electrode, and having second ion flow passage holes; and



integrating said first and second members by adhering said second-A and second-B electrodes to constitute an ion flow controller.

5,068,962

METHOD OF FABRICATING AN ENERGY METER

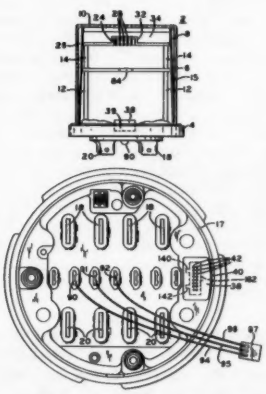
Warren R. Germer, Dover; Peter F. Coryea, Salem, and Jacob M. Stillwagon, Nottingham, all of N.H., assignors to General Electric Company, Somersworth, N.H.

Division of Ser. No. 412,351, Sep. 25, 1989, Pat. No. 4,994,734.

This application Nov. 28, 1980, Ser. No. 618,846

Int. Cl.[5] H05K *3/36*

U.S. Cl. 29—830 **10 Claims**



1. A method of fabricating or retrofitting an electronic energy meter with selected signal functions for connection in circuit with a source of power and a load to be metered and utilizing industry standard base connections, and a register assembly with associated electronics adapted to be customized at the time when customer requirements and needs for the signal functions are identified, comprising the steps of:

assembling a general purpose electronic energy meter including a base assembly meeting an industry standard configuration;

positioning a register assembly including electronic circuitry above and spaced from said base assembly;

connecting a multi-pin edge connector on said register assembly to said electronic circuitry with the pins of said edge connector extending parallel to said register assembly;

providing multiple spaced apertures through said base; manufacturing a plurality of types of register circuit boards configured to provide differing desired signal functions and sized to connect between said edge connector and said multiple spaced apertures in said base below said edge connector, each of said circuit boards configured with a second connector at the top thereof to mate with said edge

connector and provided with a third connector at the bottom thereof including a plurality of spaced pins adapted to pass through said spaced apertures in said base;

subsequently customizing said electronic energy meter by:

selecting an appropriate register circuit board to provide the desired signal functions;

inserting said spaced pins of said third connector through said spaced apertures in said base; and

moving said second connector into contact with said edge connector; whereby selected signal processing and connections are provided between said register assembly and the exterior of said electronic energy meter through the base thereof.

5,068,963

PISTON RINGS

John S. Bruce, Tilton on the Hill, Great Britain, assignor to T&N plc, Great Britain

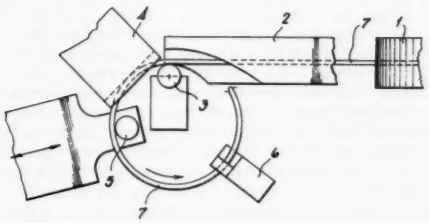
Continuation of Ser. No. 406,282, Sep. 12, 1989, abandoned. This application Jul. 10, 1990, Ser. No. 550,208

Claims priority, application United Kingdom, Sep. 19, 1988, 8821995

The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.

Int. Cl.[5] B23B *5/26*

U.S. Cl. 29—888.073 **6 Claims**



1. A method of forming an intermediate metal ring adapted for use in the manufacture of a piston ring, said method comprising the steps of initially bending a metal strip to a smaller radius of curvature than required in said piston ring; and bending said metal strip again to increase its radius of curvature to form the intermediate ring, such that the intermediate ring has the required shape for the piston ring, and wherein the initial bending of the metal strip is carried out such that the shape and size of the intermediate ring is substantially unchanged when it is subjected to heat at stress relaxation temperatures.

5,068,964

METHOD OF MAKING POLY-V GROOVED PULLEY

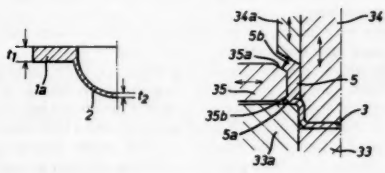
Ryohei Yabuno, Toyota, and Shin Takeda, Aichi, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 304,903, Feb. 1, 1989, abandoned, which is a continuation of Ser. No. 386,528, Jun. 9, 1982, abandoned. This application Feb. 7, 1990, Ser. No. 477,127

Claims priority, application Japan, Jun. 18, 1981, 56-094353

Int. Cl.[5] B21K *1/42*

U.S. Cl. 29—892.3 **5 Claims**



1. A method of making a pulley with a plurality of V-shaped grooves from a flat circular parent metal plate having a predetermined thickness, the method comprising the steps of:

clamping the outer peripheral portion of said parent metal plate between two dies;

pressing the central portion of said clamped flat circular parent metal plate to form a flat annular peripheral flange integral with said spherical blank,

wherein said peripheral flange is not drawn and retains the same thickness as that of said parent metal plate;

pressing the spherical blank into a hub wall having the same thickness as said spherical blank;

forming the flat annular peripheral flange into a cylindrical flange wall having the same thickness as that of said parent metal plate without axially collapsing said cylindrical flange wall;

forming a tapered annular shoulder merging with an open end of the uncollapsed cylindrical wall; and

rolling the uncollapsed cylindrical flange wall to form the V-shaped grooves in the exterior periphery of the cylindrical flange wall,

wherein the thickness of said flange wall is unchanged prior to said rolling step and is not greater than that of said parent metal plate prior to said rolling step, and wherein said cylindrical flange wall is not work hardened by a step of axially collapsing and folding said flange wall.

5,068,965

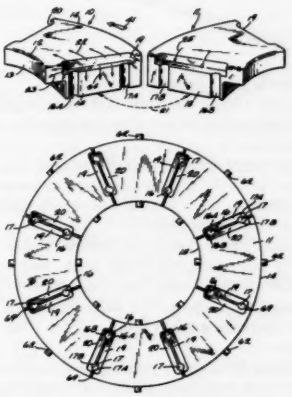
METHOD OF MAKING A LOW FLOW TILTING PAD THRUST BEARING

James H. Ball, New Berlin, and Willis W. Gardner, Waukesha, both of Wis., assignors to Delaware Capital Formation, Inc., Waukesha, Wis.

Division of Ser. No. 412,503, Sep. 26, 1989, Pat. No. 5,007,745. This application Sep. 11, 1990, Ser. No. 580,814

Int. Cl.[5] B21D *53/10;* **F16C** *17/06*

U.S. Cl. 29—898.041 **3 Claims**



1. A method of making a tilting pad thrust bearing including the steps of:

forming a metal ring containing a central axially extending hole having an inside diameter, one face of the ring constituting a load bearing surface and the ring having an outside diameter which is larger than the largest diameter inside of an annular channel in which the ring, after being cut into segments is intended to fit,

milling in said load bearing surface along radii a plurality of equiangularly spaced apart grooves extending over a majority of the radial distance between said inside and outside diameters but with the radially spaced apart ends of the respective grooves remaining closed,

drilling at least one axially directed hole in the respective grooves completely through the ring,

dividing said ring by cutting through said ring along radially lines coincident with radii of the ring which pass through the center of said holes and extend centrally of said grooves, respectively, thereby producing a plurality of segments constituting bearing pads, whereby removing metal as a result of said cutting provides gaps between pads allowing the pads to be moved radially inwardly for reducing the outside diameter of the circularly arranged pads so the pads can fit into said annular channel,

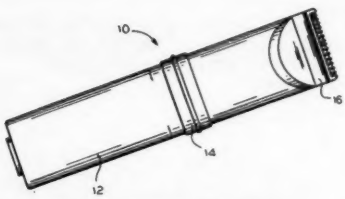
installing the reduced circularly arranged pads into said annular channel of said retainer and then adjusting the pads radially relative to the axis of said annular channel in the retainer until a predetermined clearance is established between the pads and the wall of the annular channel and a small leakage bag of desired size is established between the radially edges of adjacent pads.

5,068,966

BLADE ASSEMBLY FOR ELECTRIC HAIR CLIPPERS

Gregory S. Wahl, Sterling, and William M. Walton, Rockford, both of Ill., assignors to Wahl Clipper Corporation, Sterling, Ill.

Filed Mar. 8, 1990, Ser. No. 490,937
Int. Cl.[5] B26B *19/02, 19/00, 19/12*
U.S. Cl. 30—43.92 **10 Claims**



1. An electric hair clipper comprising

a handle and a blade assembly, said blade assembly having:

a base having means for securing said assembly to said clipper handle,

a stationary blade secured to said base, said stationary blade having a plurality of stationary teeth arranged in a row, said stationary teeth having tips which form a substantially straight blade edge,

a reciprocating blade having a plurality of teeth which complement said stationary blade teeth, said reciprocating teeth having tips which form a substantially straight line substantially parallel to and adjacent to said blade edge, said reciprocating blade being slidable over a maximum distance,

spring means for slidably pressing said reciprocating blade against said stationary blade for reciprocation of said reciprocating blade,

means for moving said reciprocating blade within said maximum distance so that said reciprocating blade travels over a predetermined operating stroke distance, said operating stroke distance being shorter than said maximum distance,

first means for maintaining said line parallel to said blade edge throughout said stroke distance, even under substantial cutting loads, but not throughout said maximum distance, and

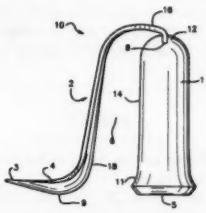
separate second means for maintaining said blade edge parallel to said line when said reciprocating blade edge is manually moved in excess of the stroke distance and up to the maximum distance.

5,068,967

UPRIGHT EATING UTENSIL FOR THE PHYSICALLY DISABLED

Suzanne P. Mars, 23649 Duffield Rd., Shaker Hts., Ohio 44122

Filed Apr. 16, 1990, Ser. No. 509,468
Int. Cl.[5] A47J *43/28, 43/00*
U.S. Cl. 30—324 **13 Claims**



1. An eating utensil for use by persons with limited wrist movement, comprising:

a base adapted to rest upon a horizontal surface;

a handle connected to the base, the handle having a longitudinal axis that extends generally vertically when the base is resting on the horizontal surface;

a shaft having a longitudinal axis that extends generally parallel to the longitudinal axis of the handle, the shaft being spaced from the handle a distance such that the user's fingers can extend between the handle and the shaft, the shaft having a first end that is connected to the handle at a vertical location above the user's fingers when the user is grasping the handle, and a second end that is located at a vertical elevation in the vicinity of the base; and

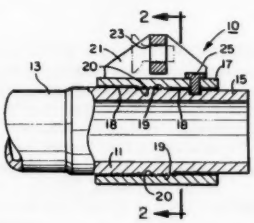
a utensil head connected to the second end, the utensil head projecting laterally from the shaft to lie in a generally horizontal plane when the base is resting on the horizontal surface.

5,068,968

ISOLATED PRESS FIT MUZZLE REFERENCE SIGHT MOUNT

Ruth C. Sillery, Albany, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 3, 1991, Ser. No. 637,035
Int. Cl.[5] F41G *1/30, 1/38, 1/54, 11/00*
U.S. Cl. 33—233 **2 Claims**



1. A reference sight mount device for use with a large caliber gun comprising:

a gun tube having a tube muzzle end and a mount receiving zone near said tube muzzle end; and

a mount means for mounting a reference sight, including a band having an internal diameter conforming to said mount receiving zone, said mount means having an integral sight mounting bracket thereon, and a lock means for rigidly fixing the position of said mount means at the muzzle end of said gun tube, wherein said mount receiving zone includes a shrink fit zone, and wherein said mount means includes a conformed zone formed by a band hav-

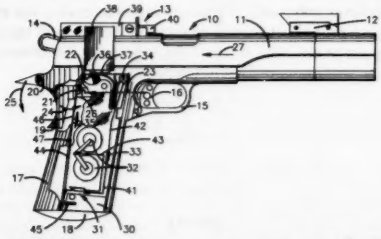
ing an internal diameter sized to expand upon heating and shrink into conformity with said shrink fit zone on said gun tube, and wherein said band also includes shrink fit zones at both ends of said band and an internal threading positioned inbetween said shrink fit zones of said hand, said mount receiving zone further having a conforming threading for cooperation with said internal threading.

5,068,969

LIGHTED GUN SIGHT

Robert M. Siebert, 1813 Yale, Ponca City, Okla. 74604

Filed Apr. 9, 1990, Ser. No. 506,084
Int. Cl.[5] F41G *1/32*
U.S. Cl. 33—241 **15 Claims**



1. A lighted gun sight for a semi-automatic pistol having a housing with an upper portion and a lower portion, a forward portion and a rearward portion, a barrel attached to said housing along its upper and forward portion, a grip attached to said housing at its lower and rearward portion, a slide slidably attached to said housing at its upper and rearward portion, said slide having an outside and being in alignment with said barrel, trigger means, and grip safety means attached to said grip for releasing said trigger means when pressure is applied to said grip safety means, and a rear sight means mounted on said slide, said lighted gun sight comprising:

(a) power means mounted in said grip;

(b) switch means mounted in said grip and connected in series with said power means for connecting or disconnecting electrically, said power means;

(c) bridge means attached along the outside of said slide and extending from said rear sight means to said grip and terminating in an end portion;

(d) electrical communication means mounted along said end portion;

(e) electrically operated light means mounted on said rear sight means and electrically connected through said bridge means to said electrical communication means;

(f) connecting means for coupling said power means through said grip and through said switch means and to said electrical communication means;

whereby when said slide is in a position to fire, and said switch means is connected to said power means said power means is connected to said electrically operated light means.

5,068,970

APPARATUS FOR FACILITATING ROADWAY GRADE MEASUREMENTS

Edward L. Kunze, 17480 La Sierra, Riverside, Calif. 92503

Continuation-in-part of Ser. No. 302,548, Jan. 26, 1989, Pat. No. 4,916,823. This application Mar. 19, 1990, Ser. No. 495,440
The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.
Int. Cl.[5] G01B *5/28*
U.S. Cl. 33—413 **25 Claims**

1. An apparatus for facilitating grade measurements between opposite roadway curb structures, each curb structure having a top surface and a back surface facing away from the other curb structure, the apparatus comprising:

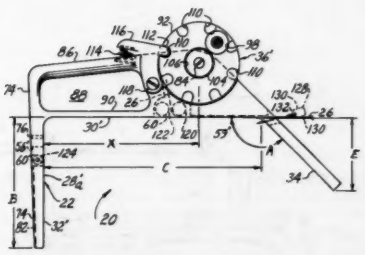
a first hook unit comprising:

(i) a rigid first frame structure having a top segment forming a base for resting on the top surface of one of the curb structures, and a back segment for engaging the back surface;

(ii) spool means rigidly connected to the first frame structure for storing and playing out a string line, including means for holding the string line to a predetermined extension; and

(iii) means for positioning the string line in contact with the top surface of the curb structure and extending directly toward the top surface of the other curb structure; and

(b) a second hook unit comprising:



(i) a rigid second frame structure having a top segment for resting on the top surface of the other curb structure, and a back segment for engaging the back surface;

(ii) means for connecting a free end of the string line to the second frame structure; and

(iii) means for positioning the string line in contact with the top surface of the other curb structure and extending directly toward the top surface of the one curb structure,

wherein at least one of the frame structures further comprises:

(c) a front segment, the front segment extending from the top segment downwardly and away from the back segment; and

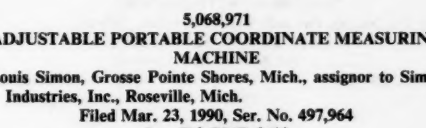
(d) means for laterally guiding the string line relative to the front segment for aligning the frame structure with the string line when tension is applied to the string line.

5,068,971

ADJUSTABLE PORTABLE COORDINATE MEASURING MACHINE

Louis Simon, Grosse Pointe Shores, Mich., assignor to Simco Industries, Inc., Roseville, Mich.

Filed Mar. 23, 1990, Ser. No. 497,964
Int. Cl.[5] G01B *5/03*
U.S. Cl. 33—503 **22 Claims**



1. A portable coordinate measuring machine, comprising:

a heavy base member having first and second ends and defining longitudinal and lateral axes;

first and second support means connected to the base member for supporting it near said first and second ends, respectively, the base member being slidably connected to at least said second support means;

actuator means connected to the base member and said second support means for effecting fine movements of the base member relative to said second support means; and

a coordinate measuring device mounted on the base member.

5,068,972

COORDINATE-MEASURING MACHINE

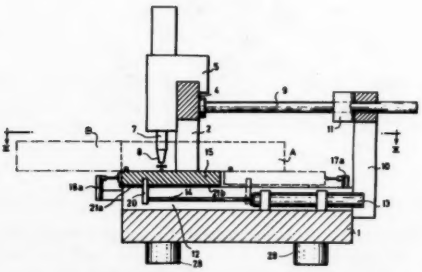
Klaus Herzog, Oberkochen, and Karl-Hermann Breyer, Heidenheim, both of Fed. Rep. of Germany, assignors to Carl-Zeiss, Oberkochen, Fed. Rep. of Germany

Filed Oct. 26, 1990, Ser. No. 604,620

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1989, 3936463

Int. Cl.[5] G01B *5/03*

U.S. Cl. 33—503 24 Claims



1. A coordinate-measuring machine having at least one upstanding column (2) guided for displacement on a table (1) for receiving a workpiece to be measured, and a device which increases the useful measurement volume of the coordinate-measuring machine, characterized by the fact that the device has a support plate (15; 115) which is displaceable on the table (1) and longitudinally alongside said column (2) into at least two defined positions, and means (16/17; 8/22; 126) for measuring the position of the support plate in each of said positions.

5,068,973

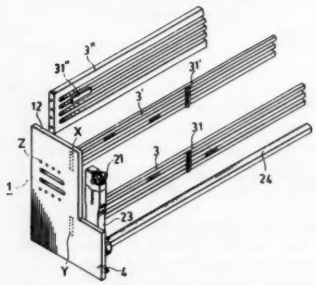
MULTIPOINT MEASURING SYSTEM WITH MEASURING MECHANISM FOR FAST EXCHANGING OF CHUCKING APPLIANCE AND AUTOMATIC MATERIAL WITHDRAWAL

Dave Yu, No. 39, Pao-hsin Road, Hsin-tien, Taiwan

Filed Apr. 26, 1990, Ser. No. 515,138

Int. Cl.[5] G01B *3/20*

U.S. Cl. 33—549 7 Claims



1. A multipoint measuring system, comprising:

a base with side plates, said side plates having slide hole seats;

slide guides having guide slots, said slide guides being installed in said slide hole seats;

automatic material withdrawal means coupled to said base for automatically withdrawing material, said automatic material withdrawal means having an axial axle, one or more rocker arms swingably disposed on at least one side of said axial axle, and one or more lifting pins disposed on said rocker arms;

a measuring base disposed on said guide slots of said slide guides;

a measuring probe seat disposed on said measuring base and having a measuring probe at its front end;

a micro adjustment device disposed on said measuring probe seat, and

wherein one or more of the slide guides are provided on the side plates such that several dimensions can be measured synchronously, with the measuring base having the measuring probe seat, micro adjustment device, and measuring probe disposed thereon, for measuring and automatically withdrawing material between the lift pins.

5,068,974

APPARATUS FOR CHECKING DIMENSIONS OF WORKPIECES

Mario Possati, and Guido Golinelli, both of Bologna, Italy, assignors to Marposs Societa' per Azioni, S. Marino di Bentivoglio (BO), Italy

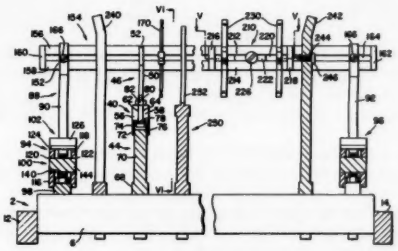
PCT No.: PCT/IT88/00077, § 371 Date Jun. 16, 1989, § 102(e) Date Jun. 16, 1989, PCT Pub. No. WO89/04455, PCT Pub. Date May 18, 1989

PCT Filed Nov. 3, 1988, Ser. No. 378,194

Claims priority, application Italy, Nov. 9, 1987, 3683 A/87

Int. Cl.[5] G01B *5/20, 7/28*

U.S. Cl. 33—549 10 Claims



1. Apparatus for checking dimensions of workpieces (42), with a support structure (2); reference and support means (40), coupled to the support structure (2) for supporting and positioning the workpiece to be checked (42); a support frame (210) carried by the support structure (2); a plurality of measuring units (230) fixed to the support frame (210) for providing corresponding signals to be processed for performing combined measurements; and coupling means (88) for coupling the support frame (210) to the support structure (2), the coupling locations of the reference and support means (40) and of the support frame (210) being basically different, characterized in that said coupling means (88) comprise a coupling device (222, 226, 228) directly coupled to the support frame (210), substantially in a single limited zone, for limiting the occurrence of external forces applied to the support frame (210) substantially at said single limited zone and preventing substantial deformations of the support frame (210).

5,068,975

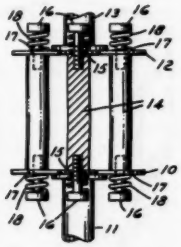
PRECISION PARALLEL MECHANICAL FLOAT

Robert F. Cusack, Grosse Pointe Park, Mich., assignor to GTE Valenite, Troy, Mich.

Continuation of Ser. No. 269,047, Nov. 9, 1988, abandoned, which is a division of Ser. No. 941,679, Dec. 15, 1986, Pat. No. 4,803,786. This application Dec. 7, 1990, Ser. No. 624,502

Int. Cl.[5] G01B 5/25

U.S. Cl. 33—644 **4 Claims**



1. A precision parallel float mechanism comprising:

(a) a base including three registration surfaces in a fixed plane of reference, each of said registration surfaces being spaced an equal distance from each of the remaining of the three registration surfaces;

(b) a relatively displaceable member having three directly opposed corresponding registration surfaces lying in a plane of reference, said plane of reference being spaced from and substantially parallel to said fixed plane of reference;

(c) three columns, each column having a pair of peripheral contact surfaces, each pair of contact surfaces being positioned at a respective opposite end of a respective column for engaging respectively a pair of said opposed registration surfaces, each of said columns including at least one reduced extension, each of said reduced extensions projecting through at least one of said opposed registration surfaces, a plurality of head extremities, each head extremity being positioned at the end of a respective reduced extension, and yieldable preloaded resilient means being positioned between each respective head extremity and each respective opposed registration surface, said yieldable preloaded resilient means establishing normal compression engagement with respective registration surfaces subject to each column tilting in substantially parallel relationship wherein the peripheral contact surfaces tilt with respect to the registration surfaces in response to a predetermined force couple imposed on the parallel planes of reference of said base and displaceable member, and said resilient means comprise compression springs reacting between respective head extremities and the base or displaceable member at the other end.

5,068,976

APPARATUS FOR LOCATING AND DRILLING STUD PLATE HOLES

Cecil J. Bell, 2203 Montecido Rd., Ramona, Calif. 92065

Continuation-in-part of Ser. No. 466,718, Jan. 16, 1990, abandoned. This application Oct. 25, 1990, Ser. No. 603,476

Int. Cl.[5] B25H 7/04

U.S. Cl. 33—666 **14 Claims**

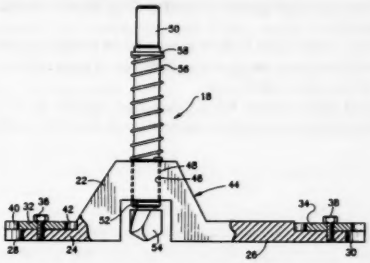
13. A bolt hole locator comprising in combination:

an elongated generally rectangular bar having first and second ends and an arch intermediate the ends thereof for defining a retraction space for a drill bit tip;

a first semi-circular notch in said first end for engaging a reference bolt;

a second semi-circular notch in said second end for engaging a reference bolt;

drill bit journal means comprising an elongated tubular sleeve having a lower end thereof rotatably journaled in a bore and bearing means located in said arch for rotatably journaling a shaft of a drill bit in said bar in a location intermediate to the ends thereof for dividing said bar into a first arm of a first length of three and one-half inches for location and drilling a hole a first distance from said reference bolt and a second arm of a second length of five and one-half inches for locating and drilling a hole a second distance from said reference bolt;



a drill bit shaft rotatably and reciprocably mounted in said bearing means, and having means for detachably receiving a drill bit tip on a lower end thereof normally positioned within said retraction space; and

retraction spring means for biasing said drill bit shaft so a drill bit tip on a lower end thereof is normally positioned within said retraction space.

5,068,977

APPARATUS FOR REMOVING WATER FROM CURVED GLASS PANEL AFTER WASHING IN PRODUCTION LINE

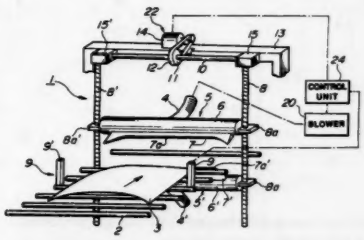
Hideichi Syori, Matsusaka, and Haruhisa Suda, Mie Pref., both of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Jul. 31, 1990, Ser. No. 560,820

Claims priority, application Japan, Jul. 31, 1989, 1-89977[U]

Int. Cl.[5] F26B 21/00

U.S. Cl. 34—54 **15 Claims**



1. An apparatus for removing water from a curved glass panel after washing, comprising:

a conveyor for conveying a curved glass panel while holding same in such a manner that the curved glass panel is bent upwardly and has opposite ends in contact with said conveyor adjacent lateral ends thereof;

a pair of air outlet units for blowing air against upper and lower surfaces of the curved glass panel, respectively, and thereby driving water off therefrom;

first drive means for driving said air outlet units to move upwardly and downwardly;

detecting means disposed forward of said air outlet units with respect to the order in which the curved glass panel conveyed by said conveyor comes thereupon, for detect-

ing a height of the curved glass panel above said conveyor and producing a signal representative thereof;

control means responsive to the signal from said detecting means for controlling operation of said first drive means and thereby holding said air outlet units at desired positions relative to the upper and lower surfaces of the curved glass panel;

said air outlet units having nozzles disposed adjacent the upper and lower surfaces of the curved glass panel, said nozzles having terminal ends elongated crosswise of said conveyor and curved corresponding to said curved glass panel;

said air outlet units further having pivot means for allowing said nozzles to swing in the direction of conveyance of the curved glass panel; and

second drive means for driving said nozzles to swing in response to variation in curvature of the glass panel.

5,068,978

APPARATUS FOR THE TREATMENT AND CONVEYANCE OF FEED SLUDGE

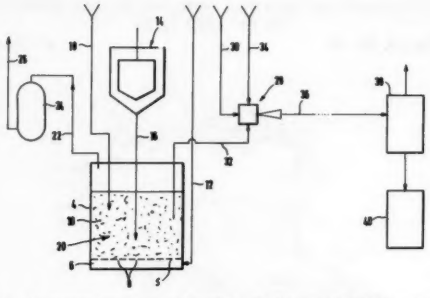
Peter Leister, Waldbronn, Fed. Rep. of Germany, assignor to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen, Hanover, Fed. Rep. of Germany

Division of Ser. No. 344,820, Apr. 28, 1989, Pat. No. 4,906,409. This application Feb. 16, 1990, Ser. No. 480,944

Claims priority, application Fed. Rep. of Germany, May 4, 1988, 3815082

Int. Cl.[5] F26B *17/00*

U.S. Cl. 34—57 A **4 Claims**



1. An apparatus for treating feed sludge produced in reprocessing nuclear foods comprising

a fluidized bed drier having a perforated false bottom;

means for discharging heated compressed gas below said false bottom;

means for feeding glass frit and said feed sludge into said drier;

means for blowing a drying gas upwardly through said perforations;

means for withdrawing moisture-laden gas from said drier;

a vitrification device remote from said drier;

a conduit connecting said drier to said vitrification device; and

means for withdrawing dried glass frit/feed sludge mixture from said drier and conveying it through said conduit to said vitrification device.

5,068,979

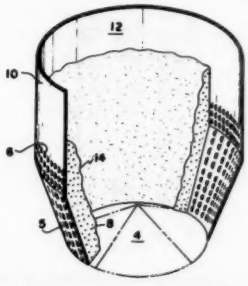
APPARATUS FOR CONDITIONING PARTICULATE MATERIAL

Jack Wireman, and Daniel R. Wireman, both of Failbrook, Calif., assignors to Blaw Knox Food & Chemical Equipment Company, Buffalo, N.Y.

Filed Jan. 11, 1990, Ser. No. 463,557

Int. Cl.[5] F26B *17/24*

U.S. Cl. 34—58 **21 Claims**



1. Apparatus for heating particulate vegetable material comprising a chamber for receiving the particulate vegetable material said chamber having a generally circular base and an upwardly extending divergent wall defining a segment of a cone with a central axis and a plurality of openings in said wall, means for heating a fluid mass, means for inducing the heated fluid mass generally tangentially into said chamber to rotate the vegetable material about the axis with relative movement with respect to said chamber and for maintaining the rotating vegetable material in a relatively densely packed state during the heating thereof, exit means in an upper portion of said chamber for allowing the heated fluid mass and any chaff produced thereby to leave the chamber and means for removing the material from said chamber.

5,068,980

POCKET SEALING STRIP ARRANGEMENT IN A SINGLE-WIRE DRYING GROUP

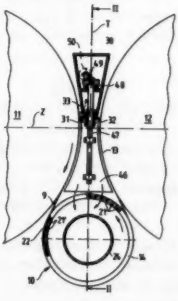
Wolfgang Müller, Giengen, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Jun. 6, 1990, Ser. No. 534,119

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1990, 4008434

Int. Cl.[5] F26B *11/02*

U.S. Cl. 34—117 **27 Claims**



1. An arrangement for a single-wire drying group for a web of paper, or the like, to be dried, the drying group comprising:

a first drying cylinder having an outer surface and located upstream in the path of travel of a flexible porous support belt, a second drying cylinder having an outer surface and

located downstream of the first drying cylinder in the path of travel of the support belt, and a guide roll having an outer surface and disposed between the first and second cylinders along the path of travel of the support belt, such that the support belt travels from the first drying cylinder to the guide roll and then to the second drying cylinder;

the first and second drying cylinders and the guide roll being so placed with respect to each other that they together define a pocket between the first and second cylinders;

a sealing strip in the vicinity of the outer surface of the first drying cylinder, means supporting the sealing strip at a location for blocking the penetration of air into the pocket along with the entrance into the pocket of the support belt;

said pocket having reduced pressure because of said sealing strip blocking the penetration of air into the pocket and generating a partial vacuum condition in said pocket;

a variable spacing being defined between the sealing strip and the support belt that is passing over the first drying cylinder, said spacing being variable due to the sealing strip support itself being shiftable transversely to a central cylinder plane; the sealing strip support being located at least predominantly outside the pocket at the side of the central plane away from the guide roll;

the first and second cylinders having respective rotation axes that define said central plane between the rotation axes of the drying cylinders, the guide roll being at one side of the central plane, the pocket being defined between the drying cylinders and the guide roll and being defined at the side of the central plane toward the guide roll;

a porous support belt for passing from the first drying cylinder, then over the guide roll, and then over the second drying cylinder; the drying cylinders, the guide roll and the porous support belt being so placed with respect to each other and being so arranged with respect to a web to be dried that such web is present between the outer surfaces of the first and second cylinders and the support belt, and such that the support belt is present between the guide roll outer surface and the web.

5,068,981

SELF-VENTILATING DEVICE FOR A SHOE INSOLE

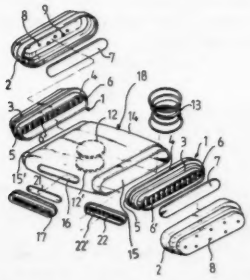
In Soo Jung, 298-25 Buam-1-Dong, Pusanjin-Ku, Pusan, Rep. of Korea

Filed Nov. 30, 1990, Ser. No. 619,994

Claims priority, application Rep. of Korea, Oct. 27, 1990, 90-16401

Int. Cl.[5] A43B *7/06, 13/20, 21/30*

U.S. Cl. 36—3 R **2 Claims**



1. A self-ventilating device built in the heel portion of an insole of a shoe, said self-ventilating device comprising:

a cylindrical heel chamber body having a spring disposed therein and being provided with a corresponding groove disposed in the interior surfaces of a base and a cover thereof for tightly receiving the spring, said spring having a small middle portion configuration,

a pair of air outlet member assembled with both ends of said cylindrical heel chamber body, each of said outlet members including:

an inner casing having a plurality of apertures, said inner casing being provided with a first circumferential space disposed tightly receiving a circumferential edge of the cylindrical heel chamber body and having a wide, circumferential edge disposed in the outer side thereof,

an outer casing assembled with said inner casing for forming a second circumferential space so as to avoid any impact from the cylindrical heel chamber body, said outer casing having a plurality of outlet apertures and at least two projects for preventing the outlet valve from closing thereto, and

a movable outlet valve disposed between said inner and outer casings, and

an air inlet member assembled with a hole disposed in one side wall of said cylindrical heel chamber body, said inlet member including:

a pair of outside and inside plates with a plurality of inlet aperture and

a movable inlet valve disposed between said plates wherein at least two projects extending from said inside plate for preventing the inlet valve from closing thereto, whereby when pressure is applied to the heel chamber body, air is effectively expelled from the cylindrical heel chamber body through the air outlet members and when the pressure is released from the cylindrical heel chamber body, waste air is effectively drawn into the cylindrical heel chamber body through the air inlet member as well as simultaneously the shock being pressed to the portion of the shoe can be effectively absorbed.

5,068,982

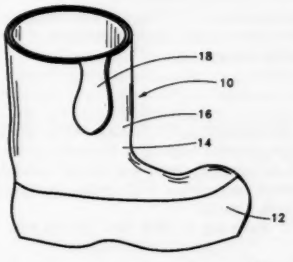
RUBBER BOOT CONTAINING HEAT REFLECTING MEANS

Prakash Devasthal, Davenport, Iowa, assignor to Servus Rubber Company, Rock Island, Ill.

Filed May 11, 1990, Ser. No. 522,311

Int. Cl.[5] A43B *1/10*

U.S. Cl. 36—4 **12 Claims**



1. A fireboot composition comprising a boot having a lower portion and an upper portion, said upper portion comprising an inner layer and an outer layer; said inner layer being unitary with said lower portion, said inner layer and lower portion comprising a rubber of synthetic rubber; said upper layer being a laminated aluminized pigment compound and vulcanized to said inner layer said aluminized pigment compound comprising a mixture of rubber, ethylene-propylene diene monomer, styrene-butadiene rubber, an aluminum pigment, and a liquid ethylene-propylene terpolymer, said aluminum pigment being dispersed substantially uniformly throughout said outer layer.

5,068,983

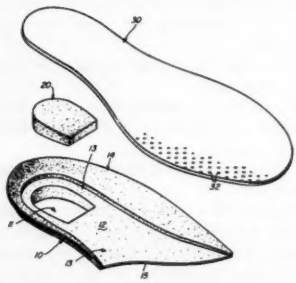
SHOE INSOLE

Michel Marc, Wellesley, Mass., assignor to Clint, Inc., Natick, Mass.

Continuation of Ser. No. 512,039, Apr. 13, 1990, abandoned, which is a continuation of Ser. No. 340,751, Apr. 10, 1989, abandoned. This application Dec. 3, 1990, Ser. No. 621,630

Int. Cl.[5] A43B *13/41, 13/40*

U.S. Cl. 36—44 16 Claims



15. A shoe insole comprising:

a resilient base piece adapted to conform to the foot and having a base surface, a top surface and a cupped periphery for accommodating the heel and extending to the arch area,

a heel piece disposed in a cut out opening in the base piece under the heel for absorption of shock,

and a top cushioning layer having a portion thereof affixed to and overlying the resilient base piece and heel piece and having a top surface adapted to receive the foot,

said resilient base piece extending from the heel area forwardly to a thin front edge that terminates short of a front edge of the top cushioning layer,

said top cushioning layer extending over the base piece from the heel area thereof and forwardly beyond the thin front edge of the base piece to underlie at least the toe area,

said resilient base piece having a base wall and a substantially cupped peripheral wall,

said top cushioning layer having a contour substantially matching that of the resilient base piece base wall,

the interface between said base piece base wall and said cupped peripheral wall being defined by a recess shoulder that receives said top cushioning layer therein and that is dimensioned so that the top surface of the top cushioning layer is substantially flush with the top surface of the cupped peripheral wall.

5,068,984

DOWNHILL SKI BOOT ASSEMBLY

William H. Kaufman; Frederick A. Harrison, both of Kitchener; Claude J. Gidman, Toronto, and Gerald Beekenkamp, Paris, all of Canada, assignors to William H. Kaufman Inc., Kitchener, Ontario, Canada

Filed Jul. 9, 1990, Ser. No. 549,920

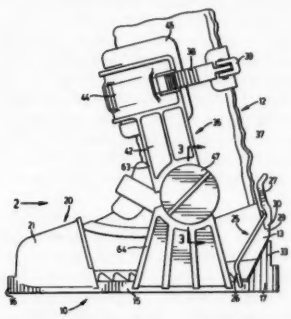
Int. Cl.[5] A43B *5/04*

U.S. Cl. 36—117 11 Claims

1. A downhill ski boot assembly, comprising:

a boot brace having a sole plate adapted to be insertable into a downhill skiing binding; forefoot receiving means and heel hold down means connected to the sole plate for positioning and holding a boot against the sole plate; and inner and outer lateral leg support means extending upwardly from the sole plate and having a pivot including spring bias means at the ankle region adjacent the pivot to provide an elastic resistance to forward rotational motion; and

a boot made of flexible materials enabling the wearer to walk normally, the boot being sized to fit in the boot brace, said boot having heel means adapted to coact with the heel



hold down means and having a leg shaft about which the leg support means may engage.

5,068,985

INNER SHOE PARTICULARLY FOR SKI BOOTS

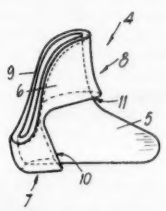
Adolfo Pozzebon, Sala D'Istrana, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed Nov. 24, 1989, Ser. No. 441,016

Claims priority, application Italy, Dec. 2, 1988, 82614 A/88

Int. Cl.[5] A43B *5/04, 23/07*

U.S. Cl. 36—117 11 Claims



1. Inner shoe particularly for ski boots, comprising a semi-rigid upper with which a lining is removably associated, at least one of said semi-rigid upper and said lining having means for their mutual temporary engagement, said lining comprising a first part which is shaped complimentarily to the inside of said semi-rigid upper and a second part which is arranged outside said first part and constitutes said means for temporary engagement with said semi-rigid upper, said second part embracing said first part at the region of the heel and at the region adjacent to the foot instep.

5,068,986

EXCAVATING TOOTH POINT PARTICULARLY SUITED FOR LARGE DRAGLINE BUCKETS

Larren F. Jones, Aloha, Oreg., assignor to Esco Corporation, Portland, Oreg.

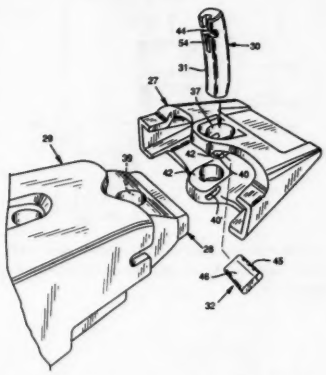
Filed Aug. 30, 1990, Ser. No. 574,799

Int. Cl.[5] E02F *9/28;* E21B *10/62*

U.S. Cl. 37—142 A 11 Claims

2. A tooth point for installation on an adapter, said tooth point comprising a relatively elongated unitary body having an earth-engaging edge at the forward end thereof and a socket extending forwardly from the rear end thereof, said point being defined by a top wall, a bottom wall and a pair of sidewalls, and aligned pin-receiving top and bottom wall openings in said top and bottom walls spaced forwardly of said rear end and communicating with said socket so as to be alignable with a pin-receiving opening in a nose of an adapter, said top wall adjacent the opening therein providing a top surface constitut-

ing party of the point exterior and a bottom surface providing part of said socket, said top wall opening providing a generally vertical surface connecting said top and bottom surfaces, said generally vertical surface being equipped with a cavity for



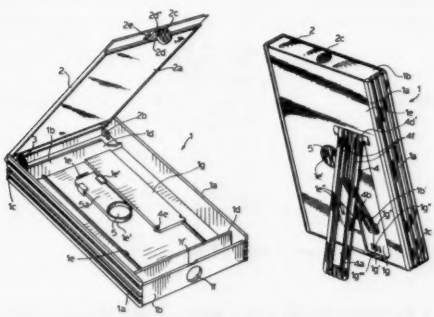
receipt of a lock adapted to engage a pin in the openings of said point, said cavity having upper and lower walls extending generally perpendicularly to said sidewalls whereby said upper and lower walls are adapted to solely support a lock prior to engagement with a pin in said openings.

5,068,987

PICTURE DISPLAY RECEPTACLE

Sergio Tontarelli, Via Gioletti 62, Fraz. S. Rocchetto, Castelfidardo, Ancona, Italy

Filed Jul. 22, 1987, Ser. No. 76,287
Claims priority, application Italy, Mar. 13, 1987, 520/87[U]
Int. Cl.[5] A47G *1/06*; G09F *1/12*
U.S. Cl. 40—152.1 **18 Claims**



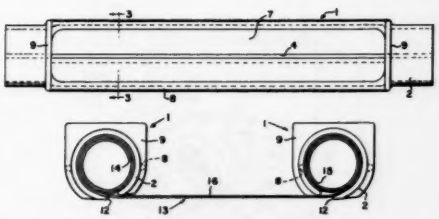
1. A receptacle for holding and displaying a stack of photographs and for presenting the top photograph for view comprising a front and rear and two sides, the receptacle being hinged at one end, the front being moveable in relation to the rear from a first position wherein the front is locked proximate the rear by locking means to a second position wherein the front is unlocked remote the rear yet hingedly supported at its hinged end to the rear, the receptacle thereby being totally enclosed, the front thereof having a transparent central portion circumscribed by a border, the rear thereof having detent means and a recess and carrying a stabilizing and supporting prop hinged onto the rear of the receptacle, wherein the prop consists of a long, thin strip, hinged at one end with respect to a transverse plane and moveable in relation to the receptacle from a supporting portion in use to a collapsed position wherein the prop is contained in the recess for storage, the prop possesses a long, narrow central through slot which starts close to the end of the strip opposite the hinge and extends longitudinally beyond the mid-point of said strip, wherein on the transverse axis, inside said rectangular-shaped through slot, a small flat hinged lever having detent means at the end remote the hinge, the lever being fitted and extending from the end of the slot towards the point at which the strip is fixed to the receptacle, and moveable from a position wherein the small flat hinged lever is parallel to the prop in storage to a position wherein the small flat hinged lever intersects the prop at an angle whereat the detent means of the lever engages the detent means on the rear of the receptacle thereby maintaining the receptacle in a propped position.

5,068,988

DOCUMENT SUPPORTING APPARATUS

Jack A. Mason, Frankenmuth, Mich., assignor to Susan P. Mason, Frankenmuth, Mich.

Filed Feb. 12, 1990, Ser. No. 478,955
Int. Cl.[5] G09F *11/18*
U.S. Cl. 40—514 **14 Claims**



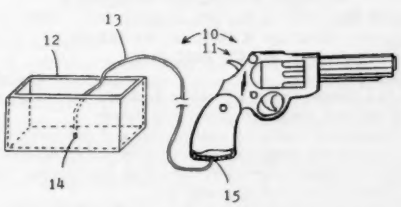
1. Apparatus for supporting a flexible, coilable document, said apparatus comprising a single tubular member having an annular wall encircling a cylindrical, unoccupied bore having a smooth surface, said tubular member being open at both ends thereof, said annular wall of said member having an axial slot therein extending longitudinally of said wall the full length of said member and said wall having a portion thereof cut away between the ends of said member to form a window, said slot being of such width as to enable one edge of said document to pass through said slot into said bore whereupon said document is coilable within said member, said bore being of such diameter as to enable the entire document to be coiled therein.

5,068,989

MEANS FOR REDUCING THE CRIMINAL USEFULNESS OF DISCHARGEABLE HAND WEAPONS

John M. Martin, 15 Charing Cross Ct., Brownsville, Tex. 78521

Continuation-in-part of Ser. No. 188,646, May 2, 1988, abandoned, which is a continuation-in-part of Ser. No. 880,095, Jun. 10, 1987, abandoned, which is a continuation-in-part of Ser. No. 589,773, Mar. 15, 1984, abandoned. This application Jul. 12, 1990, Ser. No. 551,299
Int. Cl.[5] F41A *17/00*
U.S. Cl. 42—70.01 **24 Claims**



1. A method for reducing the usefulness of a dischargeable hand weapon for many crimes where said usefulness is reduced by reducing the usefulness of said weapon for locations rela-

tively distant to said weapon compared to locations relatively close to said weapon, i.e., the intentional concealed carrying of said weapon, the intentional use of said weapon to intimidate a person and the intentional use of said weapon to cause bodily injury to a person, comprising:

linking said weapon to an unwieldy, inanimate object which will hinder said crimes in cases where said object has to be moved along with said weapon in order to commit said crimes; and

allowing said weapon to be moved independently of said object to a location at least 25 cm from said object and discharged.

5,068,990

TRIGGER MECHANISM FOR SMOOTH-BORE FIREARMS

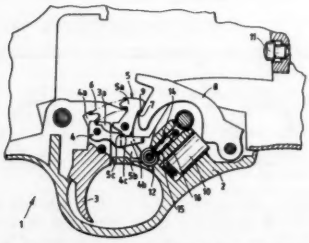
Alessandro Marzocco, Milan, Italy, assignor to Luigi Franchi S.p.A., Italy

Filed Oct. 24, 1990, Ser. No. 602,528

Claims priority, application Italy, Oct. 27, 1989, 22182 A/89

Int. Cl.[5] F41A *17/56*

U.S. Cl. 42—70.04 **7 Claims**



1. A trigger mechanism for smooth-bore firearms comprising a trigger (**3, 33**), first pivot means, mounting said trigger for pivoting movement, a release lever (**4, 34**), second pivot means mounting said release lever for pivoting movement, an engagement lever (**5, 35**), third pivot means mounting said engagement lever for pivoting movement, a hammer (**8, 38**), fourth pivot means mounting said hammer for pivoting movement, said engagement lever (**5, 35**) having opposite ends (**5***a*, **35***a*: **5***b*, **35***b*), a first (**5***a*, **35***a*) of said engagement lever opposite ends having a tooth (**7, 37**) in engagement with a counter tooth (**9, 39**) of said hammer in the armed position thereof, and safety means (**12**) operative in a first position for engaging a second (**5***b*, **35***b*) of said engagement lever opposite ends to prevent rotation of said engagement lever (**5, 35**) in a direction to release the engagement between said tooth (**7, 37**) and counter tooth (**9, 39**) and being further operative in a second position for disengaging said second engagement lever opposite end (**5***b*, **35***b*) to permit rotation of said engagement lever (**5, 35**) in a direction to release the engagement between said tooth (**7, 37**) and counter tooth (**9, 39**).

5,068,991

GUNSTOCK STORAGE ASSEMBLY

Larry N. Reed, HC 72, Box 149, Cookson, Okla. 74427

Filed Apr. 9, 1991, Ser. No. 682,269

Int. Cl.[5] F41C *23/22*

U.S. Cl. 42—71.01 **11 Claims**

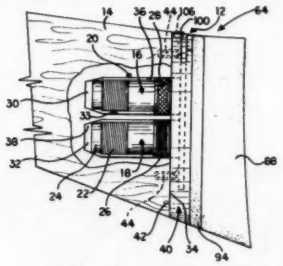
1. In a shotgun having a shoulder stock provided with a rear most end wall, the improvement comprising;

a chamber extending forwardly from said end wall for the storage of a shotgun accessory within said shoulder stock,

first substantially vertically extending interlocking means fixed relative said stock end wall,

a separable butt plate having second substantially vertically extending interlocking means attached thereto,

said first and second interlocking means engageable with one another upon a parallel sliding displacement therebetween to attach said butt plate to said stock end wall to cover said chamber, and



catch means manipulatable to maintain said butt plate attached to said stock and prevent unintentional separation therebetween.

5,068,992

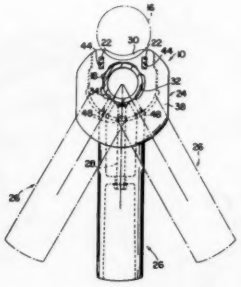
FOREARM ASSEMBLY

George A. Velezis, 175 Skyline Dr., Middlebury, Conn. 06762, and Alan I. Mossberg, 4375-34th St. South, St. Petersburg, Fla. 33711

Filed Aug. 13, 1990, Ser. No. 566,270

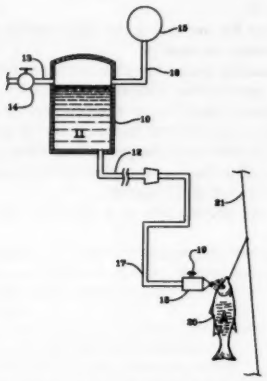
Int. Cl.[5] F41C *23/16*

U.S. Cl. 42—72 **16 Claims**



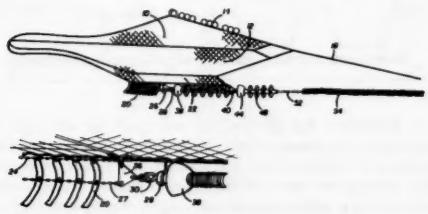
1. Forearm assembly comprising an axially elongate forearm having a pair of spaced apart rearwardly open recesses therein, an action bar assembly having a pair of elongate action bars, each of said action bars having a forward end portion received within and substantially complementing an associated one of said recesses in said forearm, retaining means for securing said action bars to said forearm and including at least one fastening member, supporting means for mounting said forearm on a cylindrical magazine tube of an associated firearm for sliding movement along the magazine tube, a pistol grip, and mounting means for releasably securing said pistol grip to said forearm in a selected one of plurality of fixed mounting positions angularly spaced apart relative to each other about the longitudinal axis of said forearm and including a plurality of angularly spaced apart threaded openings in said forearm and a single threaded fastener passing through said pistol grip and threadably engaged in a selected one of said threaded openings.

5,068,993
METHOD AND APPARATUS FOR ANESTHETIZING CAUGHT FISH
John G. Millar, P.O. Box 160, Volcano, Hi. 96785
Filed Oct. 5, 1990, Ser. No. 593,776
Int. Cl.[5] A01K *69/00*
U.S. Cl. 43—4 18 Claims



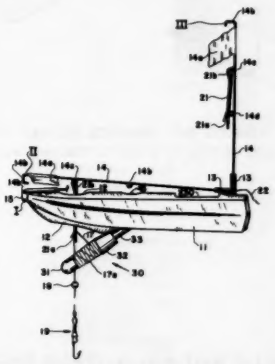
1. A method for immobilizing fish which have bene caught which comprises:
providing a container containing a quantity of anesthetizing fluid , said container having an outlet coupled to a valve for controlling the flow of said anesthetizing fluid out of said container; and
opening said valve and sparying he gill area of a caught fish with said anesthetizing fluid after at least the gill area of said fish has emerged front e water.

5,068,994
FOOTROPE CONSTRUCTION FOR A BOTTOM TRAWL
Michael Stone, Edmonds, Wash., assignor to Gourock Pacific, Inc., Seattle, Wash.
Filed Dec. 22, 1989, Ser. No. 454,995
Int. Cl.[5] A01K *73/02*
U.S. Cl. 43—9.9 3 Claims



3. A footrope construction for use with a bottom trawl generally comprising a conical net having side wings to herd fish into the mouth of the net, flotation devices attached to the upper part of the mouth of the net to provide hydrodynamic lift, and wire ropes attached to the side wings of the net horizontally, said footrope construction comprising a series of rubber straps maintained substantially in the vertical at a specific vessel speed, thus allowing the strap to lightly contact the ocean bottom and create a mudcloud which will provide a visible deterrent for the regular fish entering the wings of the trawl to escape under the net while passing over the shellfish without causing damage and without capturing them in the net, a first chain attached to the bottom of the net for holding the upper end of the straps, a second chain passing through the center of the straps, and a weight associated with the second chain for maintaining the straps substantially vertical.

5,068,995
FLOATING TIP-UP FISHING RIG WITH SWIVEL FISHING BOBBIN
John R. Rinehart, Milton, Wis., assignor to American Institute of Taxidermy, Inc., Janesville, Wis.
Filed Oct. 18, 1990, Ser. No. 599,478
Int. Cl.[5] A01K *91/00, 97/12*
U.S. Cl. 43—17 11 Claims

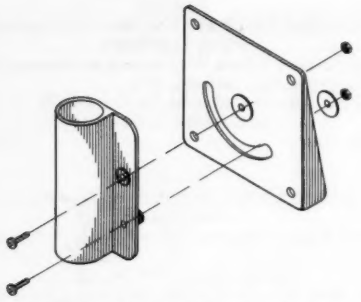


1. A floating tip-up fishing rig comprising:
a float body;
a flagpole;
spring means mounted atop said body near the rear end thereof and connected to the bottom portion of said flagpole, urging it to an upright position;
an opening vertically through said float body near the forward end thereof;
a fishline bobbin swivel-mounted to the bottom of said float body centrally thereof within a cavity therein, and extending below the body;
a fishline coiled about the bottom portion of said bobbin; and
a cotter pin having an eye end, on open flared end, and an elongated closed portion between said ends, said eye end connected to said flagpole, and said flared end extending down into said opening;
whereby some of said fishline may be pulled from its coiled portion on the bobbin and easily set in the closed portion of said cotter pin, and whereby said bobbon may move freely in a circular motion within said cavity when a fish takes out fishline and moves in a circular motion.

5,068,996
SELF-STORING FISHING ROD HOLDER
Walter A. Shank, 4918 Southland Dr., Sarasota, Fla. 34231
Filed Mar. 28, 1990, Ser. No. 503,473
Int. Cl.[5] A01R *97/10*
U.S. Cl. 43—21.2 7 Claims

1. A multi-directional fishing rod holder comprising:
a wedge shaped baseplate with means for mounting the plate to a support, said baseplate comprising an arcuate slot of predetermined length extending equidistantly around a pivot point centered in said baseplate,
a holding tube for a fishing rod, a flange integrally formed with said holding tube and extending tangentially from an outer surface thereof, and a stopping portion integrally formed on the surface of said flange,
a first threaded bolt extending through the center of said flange and serving to connect said flange to said pivot

point, said stopping portion being positioned in said arcuate slot and serving to limit the pivotal movement of said holding tube, and



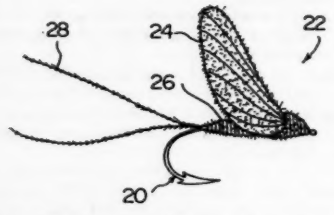
a second threaded bolt extending through said stopping portion and serving to secure a retaining washer.

5,068,997

ARTIFICIAL BAIT AND MATERIAL THEREFOR

Kenshiro Shimazaki, 4-334-1, Honcho, Kiryu-shi, Gunma-ken, Japan

Filed Oct. 23, 1990, Ser. No. 601,355
Claims priority, application Japan, Jul. 4, 1990, 2-175419
Int. Cl.[5] A01K *85/00*
U.S. Cl. 43—42.25 **4 Claims**



1. An artificial bait assembly comprising a hook and an artificial bait,

at least apart of the artificial bait comprising a light-pervious sheet-like substrate and fine, water-repellent, featherlike elements;

said fine featherlike elements being bonded to the sheet-like substrate;

the sheet-like substrate having two light-pervious plastic films, and an adhesive for bonding the two plastic films together; and,

means for coloring said substrate;

said bait including a body portion, a wing portion, and a tail portion,

said wing portion being formed of said light-pervious sheet-like substrate;

said body portion being formed of a band-like substrate; and,

said tail portion being formed of a filament material;

said fine featherlike elements being applied to said wing, body, and tail portions; and, said water repellent being applied to at least a portion of said featherlike elements.

5,068,998

PROCESS FOR IMPROVING THE ORGANOLEPTIC PROPERTIES OF WINES

Yves Vanysacker, Mouscron, Belgium, assignor to Amchim S.A., Belgium

Continuation-in-part of Ser. No. 168,013, Mar. 14, 1988, abandoned. This application Sep. 8, 1989, Ser. No. 404,542
Claims priority, application France, Mar. 13, 1987, 87 03495
Int. Cl.[5] A01C *1/00;* **A01G** *7/00;* **A01N** *25/02*
U.S. Cl. 47—58 **18 Claims**

1. A process for improving the organoleptic properties of wines comprising the steps of

treating standing grapes less than one month before harvest with a composition consisting essentially of a surface active-agent formed from a saponification of an oil by means of an alkali metal hydroxide in the presence of an alcohol selected from the group consisting of ethanol and isopropanol to form a saponified oil that renders the cuticle of said grapes hydrophilic;

applying said composition at a rate of 5 to 50 liters per hectare;

harvesting said grapes, and

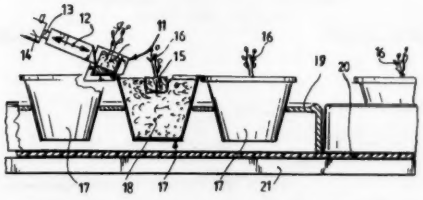
processing said grapes.

5,068,999

APPARATUS AND METHOD FOR PLANTING OUT PLANTS

Anthony Visser, 's-Gravendeel, Netherlands, assignor to Visser 's-Gravendeel Holding B.V., 's-Gravendeel, Netherlands

Continuation of Ser. No. 68,351, Jul. 1, 1987, abandoned. This application Jul. 14, 1989, Ser. No. 382,067
Claims priority, application Netherlands, Jul. 7, 1986, 8601765
Int. Cl.[5] A01G *23/02*
U.S. Cl. 47—73 **19 Claims**



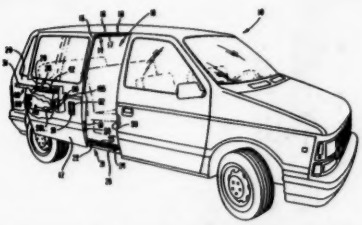
1. Apparatus for germinating and growing seedlings for subsequent transplant which comprises the combination of a plurality of separate strips and support tray means for removably holding the strips in side-by-side packed relation, each strip having a uniform width and being provided with a bottom and a plurality of upstanding blocks each of said uniform width and with the blocks being disposed in uniformly spaced relation along the length of each strip in which the uniformly spaced relation is equal to said uniform width so as to present upwardly opening recesses in said uniformly spaced relation along the length of each strip and which recesses are open at the opposite sides of each strip, the recesses of adjacent strips being staggered in said uniformly spaced relation so that the recesses of the side-by-side packed strips define a checkerboard pattern in said support tray means, and said support tray means positioning upper surfaces of the blocks in substantially the same plane to facilitate filling the recesses with soil for implantation of seed for germination and growth.

5,069,000

REVERSING APPARATUS FOR POWERED VEHICLE DOOR SYSTEMS

Lawrence H. Zuckerman, Easton, Pa., assignor to Masco Industries, Inc., Taylor, Mich.

Filed Mar. 22, 1990, Ser. No. 497,546
Int. Cl.[5] E05F *15/02*
U.S. Cl. 49—28 18 Claims



11. In an automatic powered door closing system driven by an electric motor, an electronic system for sensing a predetermined increased resistance to closing of a door, said electronic system comprising:

first means for monitoring substantially instantaneous electric current provided to said electric motor, said first means including means for generating a first signal value changing in proportion with changes in said instantaneous electric current;

second means for generating a second signal value corresponding to an average of said first signal value over a shifting span of recent time less than about one second long; and

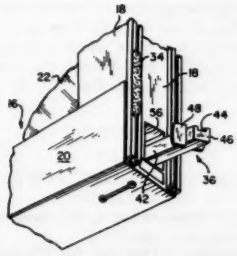
output means for producing an output signal indicating that an obstruction has been encountered by the door when the difference between said first signal value and said second signal value exceeds a predetermined limit.

5,069,001

PIVOTABLE WINDOW SASH ASSEMBLY

Anthony Makarowski, Syosset, N.Y., assignor to Insul-Lite Window Manufacturing, Inc., Garden City, N.Y.

Filed Nov. 21, 1990, Ser. No. 616,642
Int. Cl.[5] E05D *15/22*
U.S. Cl. 49—176 9 Claims



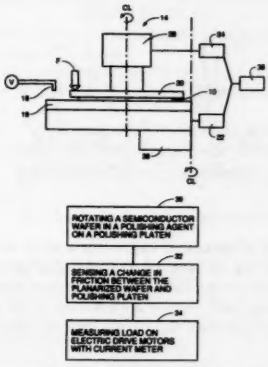
1. An apparatus for mounting a tilt window sash to a channeled window frame, comprising a pivot shoe, said pivot shoe having a side with a recessed area facing the sash, said pivot shoe being slidably located in the channel of the window frame, and a T-Bar having an elongated body with inner and outer ends and a pair of radially extending wings near the outer end of said body, the inner end of said body being adapted for mounting to the window sash, the outer end and wings of said T-Bar projecting from the sash into said pivot shoe so that the wings of said T-Bar lie rotatably within the recess of said pivot shoe in the window frame channel, the body of said T-Bar providing a pivotal axis for tilting the sash, the outer end of said body engaging said pivot shoe and said wings engaging the window frame channel to maintain alignment of the window frame and sash assembly.

5,069,002

APPARATUS FOR ENDPOINT DETECTION DURING MECHANICAL PLANARIZATION OF SEMICONDUCTOR WAFERS

Gurtej S. Sandhu; Laurence D. Schultz, and Trung T. Doan, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Division of Ser. No. 586,996, Sep. 24, 1990, 5,036,015. This application Apr. 17, 1991, Ser. No. 686,686
Int. Cl.[5] B24B *49/16*; H01L *21/304*
U.S. Cl. 51—165 R 9 Claims


ROTATING A SEMICONDUCTOR WAFER IN A POLISHING AGENT ON A POLISHING PLATEN
SENSING A CHANGE IN FRICTION BETWEEN THE PLANARIZED WAFER AND POLISHING PLATEN
MEASURING LOAD ON ELECTRIC DRIVE MOTORS WITH CURRENT METER

1. In a mechanical planarization apparatus for a wafer having a polishing head for holding and rotating the wafer against a rotatable polishing platen in a polishing slurry, an endpoint detection apparatus comprising:

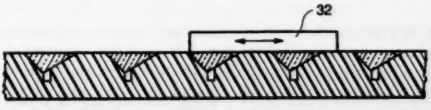
sensing means for sensing a change in friction between the wafer and polishing platen by detecting a current change to a drive motor for rotating the polishing platen or polishing head whereby a planar endpoint on the wafer is detected.

5,069,003

METHOD FOR MAKING MICROPRISMS

Robert Hogrefe, San Luis Obispo; David J. Knox, Los Osos, and George E. Newman, Nipomo, all of Calif., assignors to Dynatech Electro-Optics Corporation, San Luis Obispo, Calif.

Filed Aug. 13, 1990, Ser. No. 566,984
Int. Cl.[5] B24B *9/14*
U.S. Cl. 51—283 R 2 Claims



1. A method for producing microprisms of triangular cross section having a first angle equal to 90° + W and a second angle equal to B from a plate of material that has been polished on a first face, said method comprising the steps of:

a) blocking the plate onto a wedge of angle W with the polished face up;

b) cutting fiducial grooves into the polished face of the plate parallel to the edge of the wedge;

c) sawing vertically through the plate a constant distance

from each fiducial groove to produce a number of strips of parallelogrammatic cross section;

d) blocking the strips on a blocking plate that includes a number of spaced juxtaposed planar surfaces inclined at an angle B, with the polished faces against the planar surfaces; and,

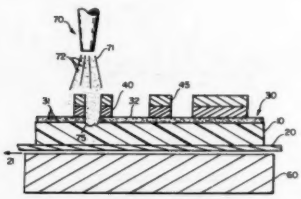
e) polishing the strips from above in a horizontal plane until the exposed width of the fiducial groove has decreased to a predetermined width.

5,069,004

ABRASIVE ENGRAVING PROCESS

R. Lee Gillenwater, 6250 NE 198 St., Seattle, Wash. 98155

Filed Feb. 27, 1990, Ser. No. 485,467
Int. Cl.[5] B24C *1/04*
U.S. Cl. 51—310 14 Claims



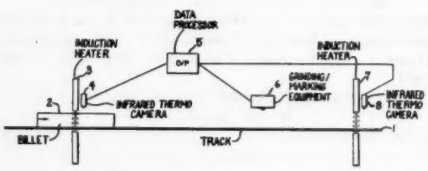
1. A method of abrasively engraving a work substrate, the method comprising the steps of: a) applying a topical magnetically interactive coating to an upper surface of said substrate; b) disposing atop said surface a stencil cut from a magnetic material; and c) exposing said stencil and said surface to abrasive etching.

5,069,005

METHOD OF FLAW DETECTION IN BILLETS

Heljar Hovland, Asker; Jan Nilsen, Lillesand, and Yngve Strom, Osto, all of Norway, assignors to Elkem Technology a/s, Norway

Filed Dec. 18, 1989, Ser. No. 451,756
Claims priority, application Norway, Jan. 10, 1989, 890106
Int. Cl.[5] B24B *1/00*
U.S. Cl. 51—322 19 Claims



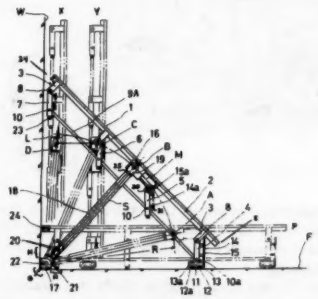
1. In a method for detecting flaws and surface irregularities in a metal workpiece where the surface of the workpiece is heated by passing it through an induction coil, and immediately downstream of the coil, scanning the workpiece with an infrared camera to determine a temperature profile across the workpiece, and recording a streaked pattern temperature profile in which the streaked pattern repeats itself where there are flaws in the surface of the workpiece, the improvement comprising the steps of using a predetermined current frequency in said induction coil which induces a current in the workpiece, said current penetrating into said workpiece a depth which exceeds the depth of the flaws which are to be detected, thereby producing a lower surface temperature in the surface of the workpiece adjacent the flaws than in the rest of the surface of the workpiece.

5,069,006

ELECTRICALLY-OPERATED FOLDING STAGE SYSTEM

Kazuo Fujita, No. 1, Hagiyamadai 1-Chome, Seto-shi, Aichiken, Japan

Filed Feb. 6, 1990, Ser. No. 475,858
Claims priority, application Japan, Apr. 13, 1989, 1-94238
The portion of the term of this patent subsequent to Oct. 10, 2006, has been disclaimed.
Int. Cl.[5] E04H *3/26*
U.S. Cl. 52—7 14 Claims



1. An electrically-operated folding stage system comprising

(a) a stage body with

(i) a platform **1**,

(ii) plural rows of upright legs **4–7** pivotally connected to a bottom J of the platform **1**, and

(iii) plural connecting members **9** each connecting lower portions **31** of the legs **4–7** of one of the leg rows,

(b) wheels **12**, **12***a* connected to bottoms of foremost legs **4** to facilitate movements of the stage body on a floor F,

(c) plural geared motors M fixed to the bottom J of the platform **1** and each capable of being rotated in either of clockwise and counterclockwise directions to move the stage body between a horizontal position P on the floor F and a vertical position X immediately adjacent to a wall W, each of the geared motors M having an output shaft **16**,

(d) swing arms each having one end **19** fixed to the output shaft **16** of one of the geared motors M, and

(e) support means **17** each provided in conjunction with one of the swing arms and located on a given position predetermined in relation to a lower portion of the wall W for pivotally supporting an opposed end **21** of the swing arm,

said given position being selected from among a corner G at which the floor F and the wall W meet, a position N on the floor F which is in close proximity to the wall W and a position H on the wall W which is on a lower level than the platform **1** when the platform **1** is in the horizontal position P.

5,069,007

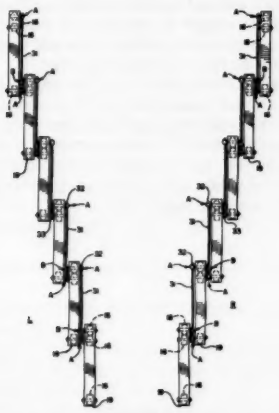
WHEEL CHANNEL GUIDE-LOCK FOR GYMNASIUM BLEACHERS

Eugene T. Paddock, Downers Grove, Ill., assignor to E. T. Paddock Enterprises, Inc., Lemont, Ill.

Filed Dec. 6, 1990, Ser. No. 622,847
Int. Cl.[5] E04H *3/12*
U.S. Cl. 52—9 14 Claims

1. A wheel channel guide-lock assembly for telescoping bleacher systems of the type having wheel channels and wheels mounted therein for movably supporting rows of seats and support structure therefor, and wherein each row and wheel channels therefor are telescopingly stackable to be sequentially slidable past one another, comprising between two adjacent wheel channels of sequentially supported bleacher rows, a pair of bracket means mounted at one side of one channel, and at an opposing side of the adjacent wheel channel,

a second type bracket means attached thereto, said both type bracket means including axle means extending therefrom and rotationally engaging wheels of the wheel channels, sleeve means extending from said both type bracket means between said wheel channels, the sleeve means of the second type bracket means spaced between said pair of bracket means, a



slide rod extending between the sleeve means of the pair of said bracket means and through said sleeve means of the second type bracket means, whereby said second type bracket means and associated wheel channel means are slidable along the slide rod with said second type bracket means being slidable between said pair of bracket means to be stopped thereagainst and thereby provide a lock for said wheel channels.

5,069,008

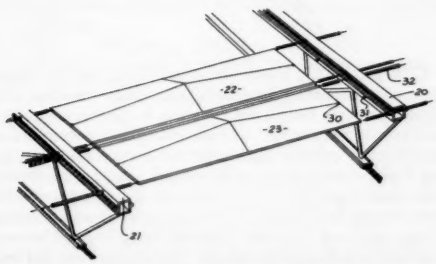
BUILDING PANEL

Peter E. Ellen, Sydney, Australia, assignor to Elspan International Ltd., Hong Kong

Filed Jul. 14, 1989, Ser. No. 379,628

Int. Cl.[5] E04B *1/32, 7/10, 7/14*

U.S. Cl. 52—80 **4 Claims**



1. A building panel for use in walls or roofs, the panel comprising: transverse intersecting axes and a periphery lying in a common plane and being formed by a flat rectangular sheet of metal deformed in a mold and comprising four portions; each portion having a surface in the form of a hyperbolic paraboloid, edges and corners; two edges of each portion meeting edges on adjacent portions in transverse intersecting planes including said transverse axes of the panel, and one corner of each portion meeting at a central point of the panel at the intersection of said transverse planes displaced from a plane containing the periphery of the panel; said panel further being elongate in form and having a length substantially greater than its width; and wherein edges of said portions that meet on the plane containing the longer axis of the panel meet in a line that lies at an angle θ_1 to a line in said plane containing the periphery of the panel for which tan θ_1 ranges from 0.05 to 0.20, and edges of portions that meet on the plane containing the shorter axis of the panel meet in a line making an angle θ_2 to a line in said plane containing the periphery of the panel, θ_2 being in the range from 0.2 to 1.0; a tubular edge stiffening member along each longitudinal peripheral edge of the panel; cable means extending longitudinally through the edge stiffening members; and means for tensioning said cable means and applying the force of the tensioned cable means to said edge stiffening members in use to compress the edges of the panel to prevent buckling.

5,069,009

SHELL STRUCTURE AND METHOD OF CONSTRUCTING

Toshiro Suzuki, 1160-12, Morooka-cho, Kohoku-ku, Yokohama-shi, Kanagawa 222, Japan

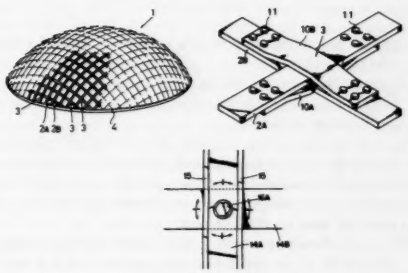
PCT No. PCT/JP89/00848, § 371 Date Apr. 20, 1990, § 102(e) Date Apr. 20, 1990, PCT Pub. No. WO90/02233, PCT Pub. Date Mar. 8, 1990

PCT Filed Aug. 22, 1989, Ser. No. 474,059

Claims priority, application Japan, Aug. 23, 1988, 63-209266

Int. Cl.[5] E04B *1/32;* **E04C** *2/42*

U.S. Cl. 52—81 **38 Claims**



1. A shell structure comprising: a lattice-like frame having a circular base member, said frame being formed of a first plurality of flexible elongate strip members having opposite end portions, said first plurality of elongate strip members being substantially in parallel alignment and arcuately shaped; a second plurality of flexible elongate strip members having first and second opposite end portions, said first end portions being secured to said base; said second plurality of elongate strip members being substantially in parallel alignment substantially normal to said first plurality of flexible elongate strip members, and said first plurality of flexible elongate strip members being secured to said second plurality of flexible elongate strip members in a manner adapted to maintain the arcuate shape of said first plurality of flexible elongate strip members.

5,069,010

GLASS DOOR OR PARTITION SUPPORT RAIL

Robert J. Trainor, Jr., Orland Park, Ill.; Samuel B. Bardo, Bristol, Ind., and David A. Leonard, Lynwood, Ill., assignors to Doralco, Inc., Alsip, Ill.

Filed Nov. 1, 1990, Ser. No. 607,888

Int. Cl.[5] E04B *1/60*

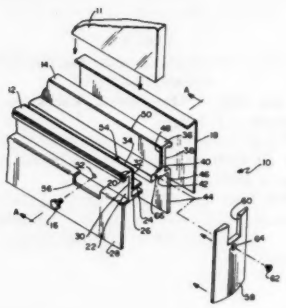
U.S. Cl. 52—127.8 **10 Claims**

1. A support rail for mounting panels of glass or the like to be used as doors or partitions or the like, which comprises:

(a) a longitudinally extending female rail section defining an outward direction and an inward direction and having an inwardly extending female flange portion, an inwardly

facing sidewall extending vertically above said female flange portion, a vertical mounting section extending below said female flange portion, and an upper mounting surface extending transversely outwardly from the top of said sidewall;

(b) a longitudinally extending male rail section defining an outward direction and an inward direction corresponding to said inward direction of said female rail section and having an inwardly extending male flange portion, an inwardly facing sidewall extending vertically above said male flange portion, a vertical mounting section extending below said male flange portion, and an upper mounting surface extending transversely outwardly from the top of said sidewall;



(c) adjustable fastening means for connecting said female rail section and said male rail section through said female and male flange portions;

(d) a lower accessory channel defined by said male and female flange portions and said vertical mounting sections;

(e) an upper channel defined by said male and female flange portions and said sidewalls for receiving the edge of a panel of glass or the like; and

(f) longitudinally extending side cover members fixedly attachable to the upper mounting section and the vertical mounting section of said rail sections.

5,069,011

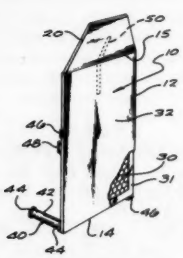
PORTABLE ACOUSTICAL PANEL STRUCTURE

James F. Jenne, Palos Verdes Estates, Calif., assignor to Grosh Scenic Studios, Inc., Hollywood, Calif.

Filed Apr. 6, 1990, Ser. No. 506,869

Int. Cl.[5] E04B *1/82*

U.S. Cl. 52—144 **9 Claims**



1. A portable acoustical panel structure comprising:

a) a main acoustical panel of substantially rectangular configuration and having a first free edge intended to rest proximate a floor or supporting stage;

b) a canopy panel hingedly affixed to said main panel for pivotal movement with regard to said main panel about a pivot axis substantially parallel to said first free edge between an operative position and an inoperative position;

c) an elongated weighted supporting base having at least one support roller thereon, said base being affixed to said main acoustical panel proximate a corner thereof formed between said first free edge and a second free edge, said base extending substantially perpendicular to a plane defined by said first and said second free edges and said base being of sufficient weight to balance and support said panel structure in operative position when said first free edge is proximate the floor or supporting stage;

said panels being constructed of a lightweight honeycomb core having a rigid sheet material adhesively bonded to oppositely facing surfaces of said honeycomb core, and wherein said main panel is hingedly connected to said canopy panel by a two way hinge whereby said canopy panel may be folded adjacent and parallel to either side of said main panel such that both sides of each of said panels are useable.

5,069,012

GAP SEALING MEANS

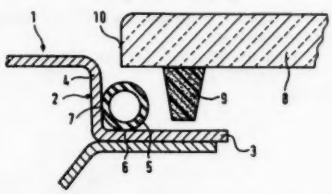
Rudolf Riederer, Pulheim, Fed. Rep. of Germany, assignor to Gurit-Essex AG, Switzerland

Filed Feb. 7, 1990, Ser. No. 476,269

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1989, 3905906

Int. Cl.[5] E04B *1/68*

U.S. Cl. 52—208 **28 Claims**



1. A gap sealing means for providing a seal between a mounting flange of a vehicle body and a windowpane mounted to said mounting flange, said mounting flange including a first wall portion and a second wall portion extending transverse to said first wall portion, said second wall portion of said mounting flange extending generally parallel to said windowpane, said windowpane being mounted by means of a bead of adhesive material for securing said windowpane to said mounting flange, said bead of adhesive material being disposed between said second wall portion and said windowpane, and said bead of adhesive material being spaced inwardly of the periphery of said windowpane and providing a gap between said second wall portion and said windowpane, said gap sealing means comprising:

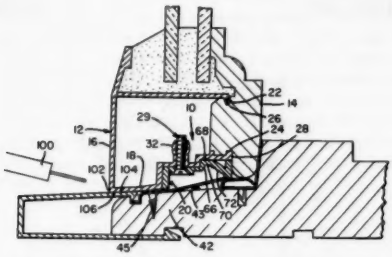
an elongate elastically deformable closed hollow profile member for sealing between said first wall portion of said mounting flange and said windowpane and for blocking contaminants from entering the gap between said second wall portion and said windowpane, said hollow profile member being spaced apart from said bead of adhesive material and having a length which essentially corresponds to the length of the perimeter of said windowpane.

5,069,013

CASEMENT WINDOW FASTENING SYSTEM

Pliml, Jr., Frank V., Arlington Heights, Ill., assignor to Illinois Tool Works Inc., Glenview, Ill.

Filed Aug. 16, 1990, Ser. No. 568,186
Int. Cl.[5] E06B 1/04
U.S. Cl. 52—214 20 Claims



1. A fastening arrangement for securing a window frame to a sash, comprising:

a receptacle defined within said frame, said frame including a first substantially planar surface leading to said receptacle defined within said frame; and

means, fixedly mounted upon said sash and projecting into said receptacle of said frame, for engaging said receptacle of said frame so as to secure said frame to said sash,

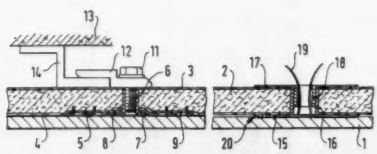
said sash including a second substantially planar surface which is disposed substantially parallel to said first substantially planar surface of said frame so as to define therebetween a space which is capable of receiving a tool by means of which said engaging means is accessible from a position external to said frame and sash so as to be disengageable from said receptacle so as to permit easy removal of said window frame from said sash.

5,069,014

HOLDING MEANS FOR SECURING FACADE PANELS

Albert Kubbutat, Buhmaystr. 13, D-8886 Wittislingen, Fed. Rep. of Germany

Filed Jan. 3, 1990, Ser. No. 460,558
Claims priority, application Fed. Rep. of Germany, Jan. 9, 1989, 3900397; Mar. 8, 1989, 3907510
Int. Cl.[5] E04B 1/38, 2/88, 2/90
U.S. Cl. 52—235 15 Claims



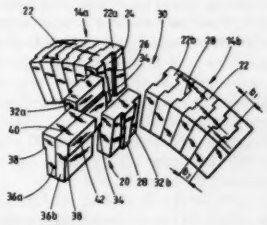
1. A building panel assembly comprising a facade panel, and holding means for securing the facade panel on a building wall, the holding means comprising a support plate of a lightweight building material having a front face secured by adhesive to a rear surface of the facade panel, the support plate including at least one outer layer of glass fabric, at least one holding plate on the front surface of the support plate, and a screw-threaded bushing held by the holding plate, the bushing extending through the support plate and the holding plate having a plurality of protrusions impressed in the support plate.

5,069,015

KEYSTONE SET

Reinhold Steinwender, Bad Kleinkirchheim, Fed. Rep. of Germany, assignor to Radex-Heraklith Industriebeteiligungs Aktiengesellschaft, Vienna, Austria

Filed Oct. 9, 1990, Ser. No. 594,110
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1989, 3933744
Int. Cl.[5] E04C 3/38; E04B 1/32; F27D 1/02; F23M 5/06
U.S. Cl. 52—575 13 Claims



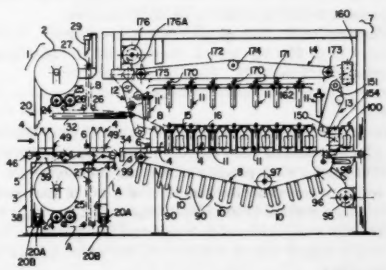
1. Keystone set for installation in the transition region (30) between two sections (14*a*, 14*b*) of a support structure (14), which is formed as an arch and is comprised of fire-resistant stones (22), each of which has a trapezoid cross-section viewed from the side and is joined on its face corresponding to adjacent stones (22) via substantially radial tongue-and-groove arrangements (24, 28), the keystone set comprising two transition stones (32*a*, 32*b*), which on their outer sides, adjacent to the respective last stone (22*a*, 22*b*) of the corresponding section (14*a*, 14*b*) of the support structure (14), have a corresponding radially extending tongue of groove profile for positive locking and are formed on their opposite faces with a substantially axial step (34), the keystone set also comprising at least one keystone (36*a*, 36*b*), whose shape is such that it is axially insertable with positive locking into the space between the transition stones (32*a*, 32*b*), said keystone having first connection means for permitting axial insertion of the keystone into the space between the transition stones.

5,069,016

METHOD AND APPARATUS FOR CONTINUOUSLY PACKAGING BATCHES OF CONTAINERS OR THE LIKE

Renzo Grossi, via Jannozzi 16, 20097 S. Donato Milanese (Milan), Italy

Filed Feb. 7, 1990, Ser. No. 476,970
Claims priority, application Italy, Feb. 14, 1989, 19430 A/89
Int. Cl.[5] B65B 13/04, 21/24, 27/04
U.S. Cl. 53—398 31 Claims



4. An apparatus for the continuous packaging of batches of items (4) to be packaged using elastic plastic wrapping material, comprising:

a source of base film (A);

an endless service conveyor (8) for carrying said base film;

a source of covering film (B);

a plurality of movable welding and cutting units (11);

means for serially and continuously positioning a plurality of said batches of items (4) to be packaged on the base film (A) on said service conveyor;

means for interposing one of said movable welding and cutting units (11) between each batch of items (4) in driving engagement with said service conveyor, each said welding and cutting unit (11) including means for welding, transversely to said path, said covering film (B) to said base film (A) between each batch of items (A) and the next batch of items (4), each said welding and cutting unit (11) further including means for cutting said films (A) and (B) transversely of said path and at a location to leave portions of welded films (A) and (B) on each side of the cut;

said endless service conveyor (8) hauing means for continually moving, along a prescribed path, said base film (A), said batches of items (4) positioned on said based film (A), and said interposed welding and cutting units (11);

means for covering said batches of items (4) with a covering film (B) while said items (4) are being conveyed on said endless service conveyor (8); and

a recycling conveyor (12, 13, 14) for recycling said welding and cutting units (11) by removing them from said service conveyor, after said welding and cutting units (11) have performed their welding and cutting operations, and relocating said welding and cutting units (11) on said service conveyor (8) at a position preceding the welding and cutting operations of said units (11) for acting upon by said means for interposing.

5,069,017

ASEPTIC FILLING MACHINE FOR FOOD

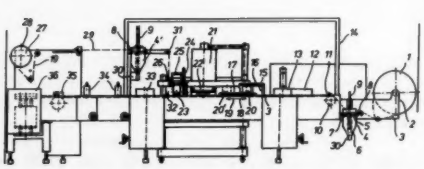
Karl Fabricius, Weidstrasse 1, CH-6331 Hünenberg, Fed. Rep. of Germany

Filed Jul. 11, 1990, Ser. No. 550,968

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1989, 3923539

Int. Cl.[5] B65B *47/00, 55/08*

U.S. Cl. 53—426 **11 Claims**



10. A method of packing goods under aseptic conditions, comprising the steps of:

moving top and bottom films from supply rolls along a predetermined path into a clean air chamber;

passing each film through a deionization station;

passing each film through a cleaning station for removing debris from the film;

forming the bottom film into a series of cup-shaped containers;

passing the bottom film through an irradiation station in which a radiator head moves in synchronization with the film from a start position along said predetermined path and then reverses direction to return to the start position so that a portion of the film is irradiated a first time as the radiator head reverses direction and said portion is irradiated a second time as the film and the radiator head move together;

filling the formed containers in the bottom film with material;

passing the filled containers to a sealing station;

transporting the top film to the sealing station above the filled containers;

irradiating the top film; and

sealing the top film to the filled containers.

5,069,018

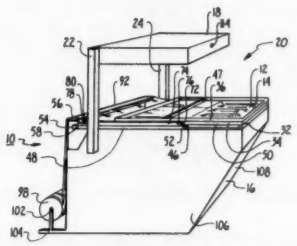
OPEN LOADING SKIN PACKAGING MACHINE

Cecil E. Puett, Las Vegas, Nev., assignor to Sunclipse, Inc., Montebello, Calif.

Filed Aug. 31, 1990, Ser. No. 576,656

Int. Cl.[5] B65B *11/52*

U.S. Cl. 53—427 **15 Claims**



8. A method of vacuum packaging, comprising the steps of:

providing a base having a stationary heating hood and a stationary packaging table distanced from and beneath said hood and located laterally outwardly therefrom and having a sealing frame movable along an arc between said heating hood and said packaging table, and a vacuum means;

placing a sheet of wrapping material in said sealing frame;

moving said sealing frame and sheet along said arc away from said packaging table to clear said packaging table, and into a heating position adjacent said stationary hood to heat said sheet;

placing a backing board onto said packaging table;

positioning a product on said backing board;

moving said sealing frame with said heated sheet onto said backing board;

applying a vacuum to said backing board to seal said sheet over said product; and

removing said backing board from said packaging table.

5,069,019

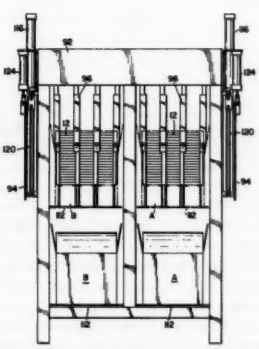
APPARATUS AND METHOD OF CONVEYING AND BOXING FROZEN PATTIES

Lloyd E. Lodewegen, 12455 198th St., Hastings, Minn. 55033

Filed Sep. 17, 1990, Ser. No. 583,840

Int. Cl.[5] B65B *25/06, 35/24, 35/32, 35/44*

U.S. Cl. 53—443 **16 Claims**



1. An apparatus for arranging disc-shaped articles, comprising:

(a) at least one platform member having a width less than the diameter of the disc-shaped articles, wherein said at least one platform member is moveable between a first elevation and a second elevation and between an extended position and a retracted position; and

(b) a plurality of spindles, operatively positioned relative to said at least one platform member such that when said at least one platform member is in said extended position, said at least one platform member is positioned between said spindles, and in said retracted position, said at least one platform member is free of said spindles, and said spindles are configured such that a disc-shaped article on said at least one platform member may pass between said spindles when said at least one platform member is at said first elevation, and a disc-shaped article on said at least one platform member is trapped between said spindles when said at least one platform member is at said second elevation.

5,069,020

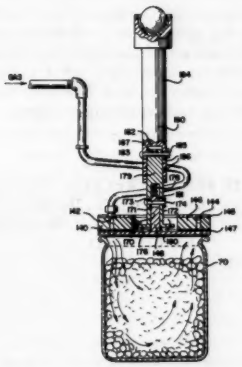
APPARATUS FOR PROVIDING CONTAINERS WITH A CONTROLLED ENVIRONMENT

John E. Sanfilippo, and James J. Sanfilippo, both of Plum Tree Rd., P.O. Box 367, Barrington, Ill. 60010

Filed Jul. 13, 1990, Ser. No. 553,179

Int. Cl.[5] B65B *31/04, 31/02*

U.S. Cl. 53—510 **20 Claims**



1. An apparatus for removing oxygen from a container, comprising:

a plunger having formed therein at least one inlet opening, and at least one outlet opening, said at least one inlet opening and said at least one outlet opening having a contour that is complementary to a perimeter of an opening in said container;

a source of inert gas;

means of providing said source of inert gas to said at least one inlet opening;

means for bringing said plunger into contact with said container over an opening in said container, said at least one inlet opening and at least one outlet opening communicating with said opening in said container.

5,069,021

APPARATUS FOR PRODUCING A FLUIDS PACKAGE

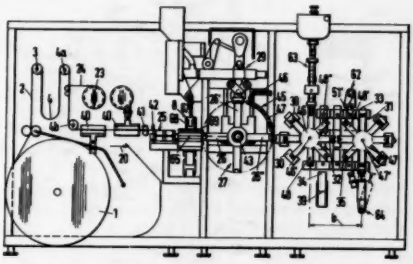
Wilhelm Reil, Bensheim; Ulrich Deutschbein, Muhltal, and Udo Liebram, Pfungstadt, all of Fed. Rep. of Germany, assignors to Tetra Pak Holding & Finance S.A., Pully, Fed. Rep. of Germany

Filed Jul. 30, 1990, Ser. No. 559,898

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1989, 3927199

Int. Cl.[5] B65B *3/02*

U.S. Cl. 53—563 **10 Claims**



1. An apparatus for producing a fluid containing package from a synthetic plastics coated paper tube, one end of said tube being at least partially closed by injection molded parts of synthetic plastics material, the other end of said tube being closed by folding and welding of the tube material, comprising means for forming a tube from a web of synthetic plastics coated paper, said forming means including means for supplying said coated paper web, means for converting said web supply into a plurality of tube blanks, means for distributing said tube blanks to a plurality of folding means, each of said folding means adapted to form a tube from said tube blanks; a plurality of mandrel wheels mounted for rotation about a common axis, each mandrel wheel comprising a plurality of radially extending mandrels, each mandrel being adapted to receive a tube from said folding means, injection station means adapted to close one end of a tube received upon a mandrel and rotated to the position of said injection station means with synthetic plastics material, a plurality of endless conveyer means adapted to receive the closed end of a tube from a mandrel upon sufficient rotation of a mandrel wheel, and said endless conveyer means being further adapted to advance said tube to a filling station, a transverse sealing station, a folding and welding station, thereby completing the fluid containing package, and to further advance said fluid containing package to removal conveyer means.

5,069,022

GANG MOWER APPARATUS

Kenton D. Vandermark, Spring Hope, N.C., assignor to Befco, Inc., Rocky Mount, N.C.

Filed Sep. 28, 1990, Ser. No. 590,008

Int. Cl.[5] A01D *34/66, 75/30*

U.S. Cl. 56—6 **7 Claims**

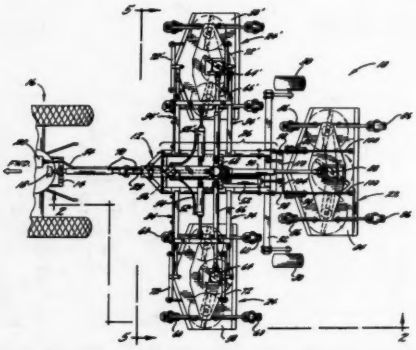
1. A gang mower apparatus for cutting grass and the like, comprising:

a wheeled chassis adapted to be connected to and towed by a vehicle over underlying terrain;

a wheeled central mower unit, mounting means mounting said central mower unit adjacent the rear of said chassis for pivotal movement between a travel position and a mowing position, said mower unit when in said travel position extending upwardly above said chassis and being out of engagement with said terrain; and said mower unit when in said mowing position being supported by the wheels thereof for longitudinal movement with said chassis along said terrain and for pitching movement relative to said chassis;

first and second wheeled side mower units;

first and second side mower units mounting means mounting respective ones of said side mower units for pivotal movement between a travel position and a mowing position, each of said side mower units when in said travel position thereof extending upwardly from said chassis and being out of engagement with the underlying terrain, each of



said side mower units when in said mowing position being supported by the wheels thereof upon the underlying terrain for longitudinal and lateral movement with said chassis and for pitching and rolling movement relative to said chassis; each of said side assembly mounting means being adjustable so as to vary the distance between the therewith associated one of said side mower units and said chassis.

5,069,023

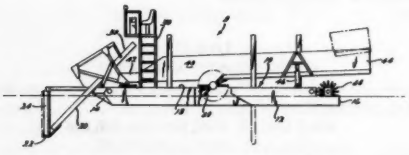
AQUATIC VEGETATION HARVESTER

Prochaska, Sr., John J., and Joseph M. Wright, both of Fenton, Mich., assignors to Modtech Industries, Inc., Flint, Mich.

Filed Jun. 25, 1990, Ser. No. 543,092

Int. Cl.[5] A01D *44/00*

U.S. Cl. 56—9 **2 Claims**



1. An aquatic vegetation harvester comprising

a barge having a stem, a stern and a generally rectangular deck;

a vegetation cutter extending forwardly of the stem of said barge;

a cutter conveyor extending aft of said vegetation cutter;

a cut vegetation conveyor extending aft of said cutter conveyor; and

means for propelling said barge through the water comprising a pair of spaced paddle wheels extendable laterally of the rectangular cross-section of the deck of said barge for in-the-water propulsion and retractable within the rectangular cross-section of the deck of said barge for over-the-road transportation.

5,069,024

CLEANING DEVICE FOR HARVESTED SUGAR CANE OR SIMILAR PRODUCTS

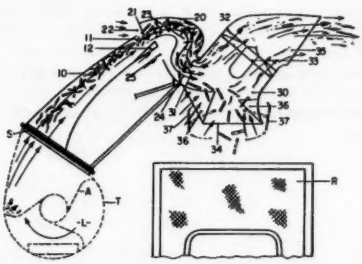
Luiz Antonio C. D. Riberio Pinto, Ribeirao Preto, Brazil, assignor to Santal Equipamentos S/A Comercio E. Industria, Ribeirao Preto, Brazil

Filed Nov. 6, 1990, Ser. No. 609,590

Claims priority, application Brazil, Nov. 7, 1989, 18905889

Int. Cl.[5] A01D *35/00, 53/00*

U.S. Cl. 56—12.8 **12 Claims**



1. Cleaning device for harvested sugar cane or similar products, of the type comprising:

cane billet guiding-raising means having a first lower inlet for the entrance of cut sugar cane billets containing trash and an upper outlet end for the exit of said material,

a deflecting duct having a first billet inlet end communicating with the upper outlet end of the guiding-raising means, said deflecting duct being provided with at least one first air inlet, a body portion formed by curves to progressively and alternately change the direction of displacement of a flowing mixture of air, cane billets and trash and an outlet,

a chamber for separating cane billets and trash having an inlet communicating with the outlet of the deflecting duct, an upper trash outlet and a lower billet outlet,

said separating chamber being provided with at least one extracting fan arranged to produce an upward air flow through the interior of said separating chamber, from the inlet towards the upper trash outlet, sufficient to launch through said outlet the trash free from the billets which were present in said separating chamber.

5,069,025

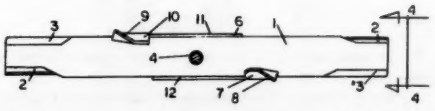
AIR FLOW DIRECTING DEVICE

Ernst W. Iversen, 2807 Garrett Dr., Bowling Green, Ky. 42101

Filed Mar. 20, 1989, Ser. No. 325,892

Int. Cl.[5] A01D *55/18*

U.S. Cl. 56—295 **3 Claims**



1. A flow directing device for use with rotary blade mowers having a blade with cutting edges adjacent the tip thereof on the leading edge of said blade and where said blade is located for rotation in a plane generally parallel to a surface to be cut and where a device within the scope of the present invention is provided for rotation with said blade and includes an air flow direction vane to be located on the underside of the central portion of the blade having a base cambered away beneath said blade to provide an air foil to generate a low pressure zone beneath said device when said blade is in rotation and where said blade is provided with upstanding vane means on at least

one side of said blade where said vane means are located on the leading edge of said blade inwardly of said cutting edge and wherein said vane means is tilted inwardly over the blade.

5,069,026

PUSH-PULL RAKE

Richard J. Johnson, 1425 Algoma St., New London, Wis. 54961

Filed Oct. 9, 1990, Ser. No. 594,549
Int. Cl.[5] A01D *7/02*
U.S. Cl. 56—400.11 16 Claims

1. A rake body, comprising:

(a) a rake body platform, said rake body platform comprising a top surface, a bottom surface, a front, a rear, and opposing sides between said front and said rear;

(b) an upstanding rear wall secured to said rake body platform and extending upwardly from said top surface of said rake body platform;

(c) upstanding side walls secured to said rake body platform, said side walls extending upwardly from said top surface of said rake body platform and forwardly of said rear wall toward said front of said rake body platform; and

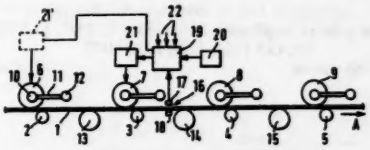
(d) a plurality of upstanding teeth spaced along said front of said rake body platform and extending upwardly from said platform, said upstanding rear and side walls collectively comprising a receptacle having an open top and an open front, said rear wall and said side walls, collectively, having sufficient height that said rake body is effective, as said rake body is pushed along the ground surface with said rake body platform disposed at an angle of about 25 degrees to about 45 degrees with the ground, and with said front of said platform generally comprising the apex of said angle, said teeth extending upwardly from the ground, to collect and immobilize a mass of lawn debris thereon, and, upon further pushing of said rake body, to cause accumulation of additional lawn debris in front of said rake body as an extension of said immobilized mass of said lawn debris.

5,069,027

TANGENTIAL BELT DRIVE FOR SPINNING OR TWISTING MACHINES

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 7347 Bad Überingen, and Gerd Stahlecker, Eislingen/Fils, both of Fed. Rep. of Germany, assignors to Fritz Stahlecker and Hans Stahlecker, both of, Fed. Rep. of Germany

Filed Jul. 14, 1989, Ser. No. 379,977
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1988, 3827234
Int. Cl.[5] D01H *4/42, 13/00*
U.S. Cl. 57—264 19 Claims



1. A tangential belt drive control arrangement for spinning or twisting machines having several rotating spinning or twisting elements, which are driven by a common tangential belt which is selectively pressed by pressing means against the rotating spinning or twisting elements to drive the same, said control arrangement comprising:

belt travel path sensing means for sensing transverse deviations between the actual belt travel path and a predetermined desired belt travel path,

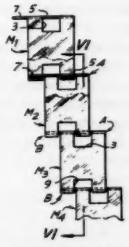
and belt travel path control means for automatically controlling the belt travel path in response to signals from the belt travel path sensing means to control said transverse deviations without interrupting the continuous movement of the belt to drive the rotating elements.

5,069,028

DECORATIVE CHAIN OF STAGGERED LINKS FORMED FROM BENT LAMINAR ELEMENTS

Domenico Fornaini, Arezzo, Italy, assignor to Uno-A-Erre Italia S.r.l., Florence, Italy

Filed Jun. 19, 1990, Ser. No. 540,147
Claims priority, application Italy, Jun. 21, 1989, 9455 A/89
Int. Cl.[5] F16G *15/14*
U.S. Cl. 59—80 7 Claims



1. A decorative chain comprising:

an assembly of links, wherein each said link consists of a bent lamina formed from a strip having bends formed along said strip transverse to the longitudinal extent of said link, each said link having

a thickness and first and second ends,

a pair of abutting tongues disposed at said first end and an articulation crosspiece disposed at said second end,

an opening formed adjacent said first and second ends, and a lateral articulation extension extending laterally from and aligned with said articulation crosspiece, and

each said link being articulated to an adjacent said link by means of said pair of abutting tongues which engage on

said articulation crosspiece and on said lateral articulation extension of said adjacent link, so that each said link is staggered laterally in the same direction in relation to said adjacent link.

5,069,029

GAS TURBINE COMBUSTOR AND COMBUSTION METHOD THEREFOR

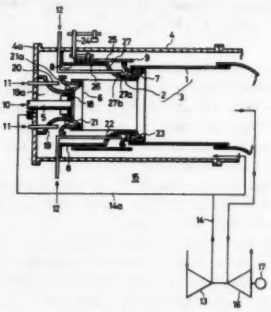
Michio Kuroda; Seiichi Kirikami; Katsukuni Hisano; Nobuyuki Iizuka; Haruo Urushidani; Isao Sato; Yoji Ishibashi, and Takashi Ohmori, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 163,376, Mar. 2, 1988, abandoned. This application Aug. 6, 1990, Ser. No. 563,191

Claims priority, application Japan, Mar. 5, 1987, 62-50060

Int. Cl.[5] F02C *3/14*; F23R *3/32*

U.S. Cl. 60—39.06 **23 Claims**



1. A multistage combustion type gas turbine combustor comprising a head combustion chamber means disposed at a head of said combustor for effecting first stage premix combustion of fuel premixed with combustion air, a first stage burner disposed at an upstream side of said head combustion chamber means and including a swirler and a fuel nozzle having a tip disposed upstream of a fuel-air mixture outlet of said swirler for introducing premixed fuel and air into said head combustion chamber means, a rear combustion chamber means connected to a downstream side of said head combustion chamber means for effecting second stage combustion of fuel premixed with combustion air, a second stage burner including a swirler, independent of said first stage burner and disposed downstream of said head combustion chamber means, for introducing the fuel air-mixture into said rear combustion chamber means, and means for regulating a flow rate of combustion air to be premixed with fuel and introduced into at least one of said head combustion chamber means and said rear combustion chamber means so as to form a suitable fuel and air premixture to effect premixed fuel combustion to thereby reduce NO_x production, said means for regulating a flow rate of combustion air being disposed upstream of said swirlers thereby regulating a flow rate of combustion air.

5,069,030

OVERSPEED PROTECTION FOR A GAS TURBINE/STEAM TURBINE COMBINED CYCLE

James H. Moore, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 302,169, Jan. 26, 1989, abandoned. This application Oct. 1, 1990, Ser. No. 590,939

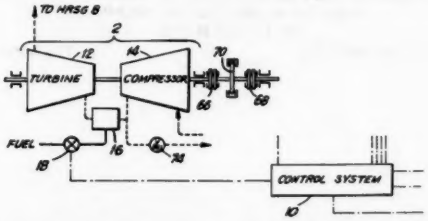
Int. Cl.[5] F02C *6/18*

U.S. Cl. 60—39.27 **5 Claims**

1. An improved combined cycle power plant and overspeed protection system of the type having a reheat steam turbine including a high pressure steam turbine section with at least one control valve, and a lower pressure steam turbine section; a gas turbine including a turbine section, a combustor, a fuel valve supplying said combustor, and an air compressor with a discharge end leading to said combustor; a load driven by said reheat steam turbine and said gas turbine; said reheat steam turbine, said gas turbine and said load all having rotating members; a heat recovery steam generator heated by said gas turbine, including a high pressure steam generating section supplying steam to said high pressure steam turbine section through said control valve, and a steam reheater section receiving steam exhausted from said high pressure steam turbine section; the improvement comprising:

a valveless steam conduit connected between the outlet of said steam reheater section and the inlet of said lower pressure steam turbine section,

a plurality of solid couplings serving to solidify couple said rotating members together as a single rotor, said rotor having a single thrust bearing,



control means for sensing a potential overspeed condition operatively connected to said control valve to prevent overspeed,

whereby the steam in said steam reheater and in said valveless steam conduit may freely expand through said lower pressure steam turbine and potential overspeed of said rotor is resisted by the combined inertia of said coupled rotating members and by the braking torque of said air compressor; and

a pressure actuated dump valve interposed between said air compressor discharge end and said combustor, and responsive to air compressor discharge pressure exceeding a preselected value, whereby upon opening of said dump valve, compressor air flow is increased and air flow to the combustor is reduced, to increase the compressor braking torque on said rotor.

5,069,031

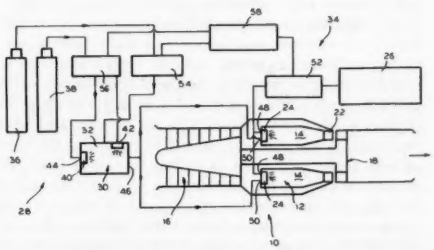
GAS TURBINE ENGINE STORED ENERGY COMBUSTION SYSTEM

Jack R. Shekleton, San Diego; Roy W. Vershure, Jr., Escondido, and Robert W. Smith, Lakeside, all of Calif., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jul. 24, 1989, Ser. No. 383,753

Int. Cl.[5] F02C *3/14*; F23R *3/30*

U.S. Cl. 60—39.12 **8 Claims**



1. A gas turbine engine, comprising:

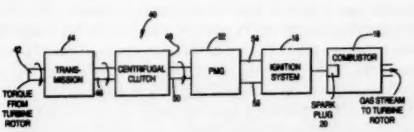
a rotary compressor;
a turbine wheel coupled to said compressor for driven movement thereof;
an annular nozzle proximate said turbine wheel for directing primary gases of combustion thereat;
an annular combustor defining an annular combustion space in fluid communication with said rotary compressor, a primary fuel source, and said annular nozzle;
said annular combustor being adapted to combust fuel from said primary fuel source and air from said compressor to generate said primary gases of combustion;
fuel injection means operatively associated with said annular combustor for injecting fuel from said primary fuel source into said annular combustion space; and
a stored energy combustion system including a selected operable auxiliary combustor having an auxiliary combustion space for generating a gaseous fuel including secondary gases of combustion therein, said stored energy combustion system including a source of oxidant and a secondary fuel source both in fluid communication with said auxiliary combustion space of said auxiliary combustor for combusting oxidant from said source of oxidant and fuel from said secondary fuel source to generate said gaseous fuel including said secondary gases of combustion therein, said auxiliary combustor being in direct fluid communication with said annular combustor for directing said gaseous fuel including said secondary gases of combustion therein to said annular combustor through said fuel injection means;
said fuel injection means being adapted to direct said gaseous fuel including said secondary gases of combustion therein from said auxiliary combustor directly into said annular combustor upon demand;
said stored energy combustion system including a first fuel injector for injecting fuel from said secondary fuel source into said auxiliary combustion space of said auxiliary combustor for combusting said fuel and oxidant from said source of oxidant to generate said secondary gases of combustion, said stored energy combustion system also including a second fuel injector for injecting fuel from said secondary fuel source into said auxiliary combustion space of said auxiliary combustor for mixing said fuel with said secondary gases of combustion for delivery to said fuel injection means operatively associated with said annular combustor, said secondary gases of combustion generated in said auxiliary combustion space producing heat to cause said fuel injected into said auxiliary combustor by said second fuel injector to be thermally cracked prior to being oxidized with air from said rotary compressor.

5,069,032

GAS TURBINE IGNITION SYSTEM

Robert C. White, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 23, 1990, Ser. No. 497,700
Int. Cl.[5] F02C *7/266*
U.S. Cl. 60—39.141 **6 Claims**



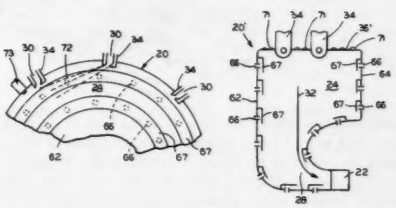
1. A gas turbine ignition system comprising:
a power takeoff coupled to the turbine for providing rotary power upon rotation of a rotor of the turbine;
a clutch having an input coupled to the power takeoff and an output which outputs torque applied to the input when the rotor is rotating at a velocity less than a velocity at which the turbine is self-sustaining and which does not output torque when the rotor is rotating at a velocity at least as great as the self-sustaining speed without control from an external source;
a permanent magnet generator coupled to the for generating electrical energy in response to rotation of the rotor; and
an ignition system powered by the electrical energy generated by the permanent magnet generator for producing ignition pulses coupled to a combustor within the turbine until the output of the clutch is disengaged from the input.

5,069,033

RADIAL INFLOW COMBUSTOR

Jack R. Shekleton, San Diego, Calif., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 21, 1989, Ser. No. 455,559
Int. Cl.[5] F02C *7/00;* **F23R** *3/16*
U.S. Cl. 60—39.36 **20 Claims**



1. A gas turbine engine, comprising:
radial compressor means for compressing air entering through a compressor inlet opening;
axial turbine means in axially spaced relation to said radial compressor means;
said radial compressor means being operatively associated with said axial turbine means;
radial combustor means intermediate said radial compressor means and axial turbine means;
turbine nozzle means proximate said axial turbine means for directing gases of combustion thereto;
said radial combustor means including a pair of axially spaced radially extending walls joined at radially outward extremes by a generally cylindrical wall, said walls defining a radial combustion space in communication with both said radial compressor means and said turbine nozzle means, and including means for introducing compressed air into said radial combustion space in a manner avoiding formation of an air film on said generally cylindrical wall;
means for injecting a liquid fuel into said radial combustion space so as to impact said liquid fuel directly onto an inner surface of said generally cylindrical wall to form a liquid fuel film thereon; and
means for igniting a mixture of fuel and air within said radial combustion space to generate said gases of combustion.

5,069,034

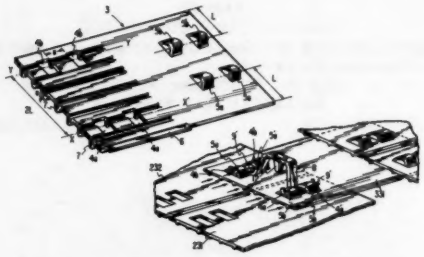
HEAT PROTECTIVE LINING FOR AN AFTERBURNER OR TRANSITION DUCT OF A TURBOJET ENGINE

Gérard E. A. Jourdain, Saintry Sur Seine, and Marc G. Loubet, Nandy, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.", Paris, France

Filed May 8, 1990, Ser. No. 521,036
Claims priority, application France, May 11, 1989, 89 06174
Int. Cl.[5] F02R *3/10;* **F02C** *7/20*
U.S. Cl. 60—261 **10 Claims**

1. A heat protective lining for the casing of an afterburner duct or transition duct of a turbojet engine, said lining comprising a plurality of tiles disposed in side by side and longitudinally overlapping relation to form a structural lining assembly for mounting in said duct casing, said lining assembly being composed of longitudinally overlapping rings of said tiles

wherein the tiles of each ring are laterally offset by half the width of a tile with respect to the tiles of each adjacent ring, each of said tiles of at least the rings intermediate the upstream and downstream endmost rings having an upstream portion including at least two apertures and a downstream portion including at least two eyelets projecting from the outer face thereof, and each tile of the downstream ring of each pair of adjacent rings having its upstream portion overlapping part of



the downstream portions of two adjacent tiles of the upstream ring of said pair of rings whereby said apertures of said overlapping downstream tile receive therethrough respective eyelets of said two overlapped upstream tiles, said lining assembly including locking means engaging with said eyelets projecting through said apertures to hold said tiles together, and fastening yokes secured to the outer faces of said tiles for the fixing of said assembly to said casing.

5,069,035

MISFIRE DETECTING SYSTEM IN DOUBLE AIR-FUEL RATIO SENSOR SYSTEM

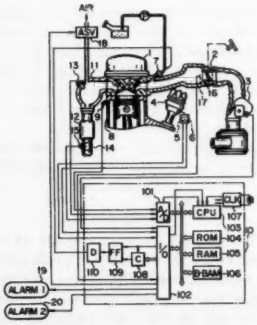
Nobuaki Kayanuma, Gotenba, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Sep. 7, 1990, Ser. No. 578,576

Claims priority, application Japan, Oct. 26, 1989, 1-277226; Nov. 9, 1989, 1-289993

Int. Cl.[5] F01N *3/28*

U.S. Cl. 60—274 **40 Claims**



1. A method of controlling an air-fuel ratio in an internal combustion engine having a catalyst converter for removing pollutants in the exhaust gas thereof, and upstream and downstream air-fuel ratio sensors disposed upstream and downstream, respectively, of said catalyst converter, for detecting a concentration of a specific component in the exhaust gas, comprising the steps of:

decreasing a main air-fuel ratio correction amount when the output of said upstream

air-fuel ratio sensor is on the rich side;

increasing said main air-fuel ratio correction amount when the output or said upstream air-fuel ratio sensor is on the lean side;

decreasing a sub air-fuel ratio correction amount when the output of said downstream air-fuel ratio sensor is on the rich side;

increasing said sub air-fuel ratio correction amount when the output of said downstream air-fuel ratio sensor is on the lean side;

adjusting an actual air-fuel ratio in accordance with said main and sub air-fuel ratio correction amounts;

determining whether or not said sub air-fuel ratio correction amount has reached a lean limit value; and

determining that an ignition system of said engine is abnormal and a misfire may occur when said sub air-fuel ratio correction amount reaches said lean limit value.

5,069,036

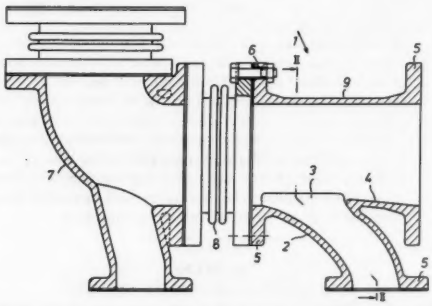
EXHAUST GAS LINE SYSTEM FOR A SUPERCHARGED INTERNAL COMBUSTION ENGINE

Norbert Schorn, Meersburg; Hugo Stock, Bergisch Gladbach; Richard Bartels, Niederkassel-Mondorf, and Willi Fendel, Cologne, all of Fed. Rep. of Germany, assignors to Kloeckner-Humboldt-Deutz AG, Cologne, Fed. Rep. of Germany

Filed Dec. 13, 1989, Ser. No. 450,226

Int. Cl.[5] F01N *7/10*

U.S. Cl. 60—323 **2 Claims**



1. An exhaust gas line system for an internal combustion engine supercharged by an exhaust gas turbocharger, having a modularly assembled exhaust gas collector pipe (1), which supplies the turbocharger with exhaust gas and is connected to all cylinders of a bank of cylinders via connecting lines (2) having individual junctions with said collector pipe (1), the exhaust gas collector pipe (1) including a plurality of individually identical modules (9), each of which includes a segment of said collector pipe (1), one of said connecting lines (2), a diffusor-shaped inlet opening (3) in said one connecting line (2) at the latter's junction with said segment of said gas collector pipe (1) said diffusor-shaped inlet opening (3) extending into said one connecting line and gradually increasing in cross section in the direction towards its junction with said segment of said collector pipe (2), and a constriction (4) in said segment of said gas collector pipe (1) immediately upstream of said inlet opening (3) providing a reduced cross section in said segment of said collector pipe whereby a slight increase in dynamic air pressure is effected in said segment of said collector pipe (1) immediately upstream of said inlet opening (3).

5,069,037

FLUID SUPPLY SYSTEM FOR VEHICLES

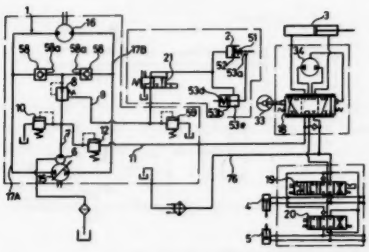
Shigenori Sakigawa, Itami; Ryota Ohashi, Sakai; Jiro Shibata, and Masahisa Kawamura, both of Amagasaki, all of Japan, assignors to Kanzaki Kokyukoki Mfg. Co., Ltd., Amagasaki, Japan

Filed Nov. 14, 1990, Ser. No. 613,082

Claims priority, application Japan, Dec. 5, 1989, 1-140893[U]

Int. Cl.[5] F16D *31/02*

U.S. Cl. 60—435 **3 Claims**



1. In a vehicle having a hydrostatic transmission which is operable to vary travelling speed of the vehicle in a non-stepwise manner, a fluid-operated clutch which is disposed in a power transmission path, and at least one hydraulic actuator which is actuated by high pressure fluid, a fluid supply system comprising:

a single hydraulic pump (6) for supplementing fluid to said hydrostatic transmission (1) and for supplying fluid respectively to said fluid-operated clutch (2) and to said hydraulic actuator (3, 4, 5), said hydraulic pump flowing out its discharge flow into a discharge path (7);

a pressure-reducing valve (8) operable to reduce its inlet pressure to a predetermined outlet pressure with flowing out a part of its inlet flow into a fluid drain path (9), said discharge path (7) being connected to said hydrostatic transmission (1) through said pressure-reducing valve so as to supplement fluid of said outlet pressure to said hydrostatic transmission, said fluid drain path being fashioned to a fluid supply path for supplying fluid to said fluid-operated clutch (2);

a high pressure relief valve (10) for establishing a high fluid pressure to be applied to said hydraulic actuator (3, 4, 5), said relief valve being connected to said discharge path (7);

a second fluid supply path (11) connected to said discharge path (7) for supplying fluid from said discharge path to said hydraulic actuator (3, 4, 5); and

a flow-restricting means (12, 12A) incorporated in said second fluid supply path (11) for maintaining fluid pressure in said discharge path (7) higher than said outlet pressure of said pressure-reducing valve (8) but substantially lower than said high fluid pressure determined by said high pressure relief valve (10).

5,069,038

PROCESS FOR REMOVERING DESORBATE PRODUCED IN THE DESORPTION OF LADEN SORPTION MATERIAL, AND APPARATUS THEREFOR

Reinhold Peinze, Selm, Fed. Rep. of Germany, assignor to Rekuperator KG Dr.-Ing. Schack & Co., Düsseldorf, Fed. Rep. of Germany

Filed Nov. 1, 1988, Ser. No. 265,783

Claims priority, application Fed. Rep. of Germany, Nov. 1, 1987, 3737408

Int. Cl.[5] F25J *3/00*

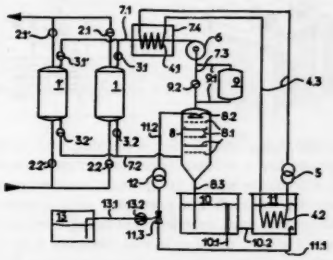
U.S. Cl. 62—18 **11 Claims**

1. A process for recovering the desorbate produced by the desorption of laden sorption materials by circulating a desorption gas through said materials, which comprises the steps of:

a) heating the desorption gas prior to its introduction into the sorption material;

b) circulating said desorption gas through said sorption material;

c) removing said desorption gas from said sorption material, said gas being laden with desorbate;



d) cooling said laden desorption gas in a direct heat exchanger, cooled by a coolant to condense, unload, and liquify said desorbate from said laden gas; said coolant being super-cooled recovered desorbate;

e) collecting said liquified condensed desorbate and supercooling same for use as said coolant;

f) removing the unladen desorption gas from said liquid desorbate and reheating and recirculating said desorption gas through steps a)–c) supra.

5,069,039

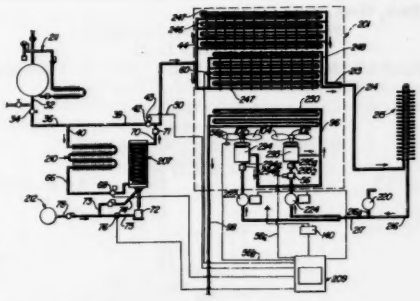
CARBON DIOXIDE REFRIGERATION SYSTEM

Patrick S. Martin, Dallas, Tex., assignor to General Cryogenics Incorporated, Dallas, Tex.

Filed Oct. 1, 1990, Ser. No. 591,386

Int. Cl.[5] F25D *21/06*

U.S. Cl. 62—50.3 **16 Claims**



1. A method of refrigerating air in a compartment comprising the steps of:

delivering liquid carbon dioxide through an evaporator means such that sufficient heat is absorbed from the air in the compartment to evaporate the liquid carbon dioxide to form a pressurized vapor;

heating the pressurized carbon dioxide vapor that is exhausted from the evaporator means to prevent solidification of the carbon dioxide when the pressure is reduced to atmospheric pressure; and

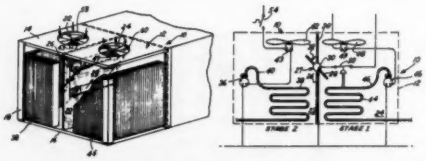
depressurizing the carbon dioxide vapor to provide isentropic expansion of the vapor into a heat exchanger means so that additional heat is absorbed from the air in the compartment.

5,069,040

COIL BYPASS ARRANGEMENT

Mark A. Walker, Dallas, Tex., assignor to Lennox Industries Inc., Carrollton, Tex.

Filed Oct. 29, 1990, Ser. No. 604,863
Int. Cl.[5] F25D *17/00*
U.S. Cl. 62—181 **12 Claims**



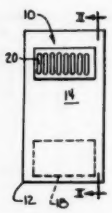
1. A condensing unit having a housing with a first stage compartment and a second stage compartment therein separated by a common wall, a compressor, condenser coil and a condenser fan in each compartment, said compressor and condenser coil in each compartment being operatively interconnected, a bypass opening in said common wall, a damper operatively associated with said bypass opening for opening and closing same, a damper motor for actuating said damper in response to attainment of a predetermined condition, whereby below said predetermined condition the damper motor is actuated to open the damper, allowing air to be drawn from the second compartment through the first compartment, and resulting in a reduced pressure differential across the condenser coil in the first compartment and a reduction in the air flow across the condenser coil in the first compartment, and with the reduction in the air flow across the condenser coil in the first compartment, the predetermined condition will be restored and the damper will be closed.

5,069,041

METHOD AND APPARATUS FOR ELECTROMECHANICAL AIR CONDITIONING OF INDUSTRIAL ELECTRONICS

David E. Thielman, Hennepin County; Dennis E. Welch, Anoka County, and Theodore P. Bezat, Hennepin County, all of Minn., assignors to McLean Midwest Corporation, Brooklyn Park, Minn.

Filed Jul. 16, 1990, Ser. No. 552,989
Int. Cl.[5] A25D *23/12*
U.S. Cl. 62—263 **46 Claims**



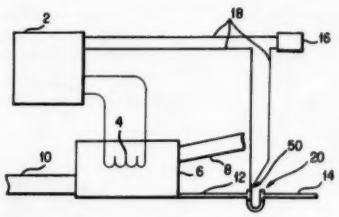
1. An industrial electronics air conditioner, comprising:
a) a conditioner cabinet;
b) an electromechanical refrigeration system within said cabinet, said system having a compressor, a condenser, an evaporator, a condenser blower and motor, and an evaporator blower and motor;
c) an ambient air inlet to the condenser and a heated air outlet from the condenser;
d) a heat load air inlet through the cabinet to the evaporator and a cooled air plenum downstream of the evaporator;
e) spaced apart cooled air outlets through said cabinet from said plenum, said outlets facing up, down, and transversely; and
f) means in said outlets for selectively directing a cooled air flow outward of said cabinet in upward, downward, or transverse directions.

5,069,042

CLEANABLE CONDENSATE TRAP

Charles F. Stuchlik, III, Rte. 1, Box 304 B, Milton, Del. 19968

Filed Apr. 13, 1990, Ser. No. 508,582
Int. Cl.[5] F25D *21/06*
U.S. Cl. 62—284 **13 Claims**



1. An air-cooling system comprising:
means for cooling air;
air handling means for containing air which is contacted with said means for cooling air and for receiving liquid removed from the air as a result of condensation;
tube means fluidwise connected to said air handling means, for conveying liquid away from said air handling means, wherein said tube means includes a trap having a U-shaped tube having first and second ends and a first T-shaped tube having first, second and third legs, said first leg being attached to said first end of said U-shaped tube and said second leg being attached to said tube means, whereby said trap can be cleaned by inserting a cleaning tool into said third leg of said first T-shaped tube and through said U-shaped tube;
a first circuit electrically connected to said means for cooling air for controlling the supply of power to said means for cooling air; and
switch means, inserted into said third leg of said first T-shaped tube, electrically connected to said first circuit and for closing said first circuit when liquid in said U-shaped tube is below a predetermined level to render said air cooling means operative and for opening said first circuit when liquid in said U-shaped tube is equal to said predetermined level to render said air cooling means inoperative.

5,069,043

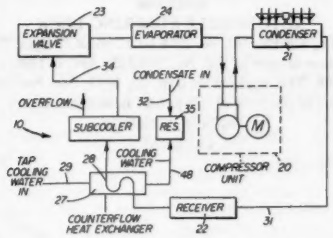
REFRIGERATION SYSTEM WITH EVAPORATIVE SUBCOOLING

Fred B. Wachs, III, Lexington, and Roy W. Abbott, Louisville, both of Ky., assignors to Advanced Cooling Technology, Inc., Lexington, Ky.

Filed Jul. 7, 1989, Ser. No. 376,432
Int. Cl.[5] F28D *5/00*
U.S. Cl. 62—305 **18 Claims**

9. An at least three-stage refrigerant condensing and subcooling system for a refrigeration unit having a compressor, condenser and evaporator comprising
a source of cooling water,
a counterflow heat exchanger receiving the cooling water;
an evaporative subcooler downstream of the condenser for subcooling said refrigerant; the flow of refrigerant from the condenser passing through said heat exchanger for additional subcooling and for warming the cooling water;
the warmed cooling water being operative to provide the

evaporative subcooling of said refrigerant including by latent heat evaporative cooling;



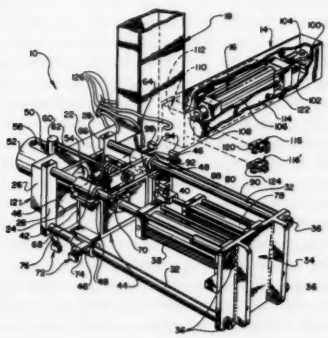
whereby said refrigerant is condensed and subcooled efficiently in the three stages including by use of latent heat evaporative cooling by warmed water in said subcooler.

5,069,044

ICE BLOCK PRESS

Ronald L. Holum, New Brighton; Patrick M. Brown, Anoka, and Ronald L. DeWall, Loretto, all of Minn., assignors to PRR Industries, Inc., Monticello, Minn.

Filed Feb. 21, 1990, Ser. No. 482,531
Int. Cl.[5] F25C *5/14*
U.S. Cl. 62—320 **16 Claims**



1. Apparatus for uniformly forming blocks of ice to a desired size, comprising:

(a) a wall defining a compression chamber into which raw ice particles are fed through an opening;

(b) reciprocally disposed ram means for urging ice particles through said opening into said compression chamber, and for compacting the particles within the chamber;

(c) means for sensing the preclusion of movement of said ram means, in a direction in which said ram means moves when urging ice particles through said opening, as a result of accumulation of compacted ice in said compression chamber; and

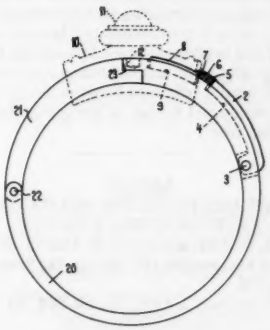
(d) means, responsive to the sensing of a preclusion of movement of said ram means, for cutting the compacted ice to a block of the desired size.

5,069,045

PIECE OF JEWELRY

André Mejias, Vevey, Switzerland, assignor to Premiere De Tabbah SA, Fribourg, Switzerland

Filed Oct. 20, 1988, Ser. No. 260,395
Claims priority, application European Pat. Off., Oct. 26, 1987, 87810612.9
Int. Cl.[5] A44C *5/00*
U.S. Cl. 63—3 **12 Claims**



1. A piece of jewelry comprising:

a generally annular-shaped body;

an arm having one end pivotably attached to said annular body;

a displaceable member having an aperture extending completely therethrough and through which said displaceable member is slideably engaged with said annular body to releaseably secure said arm to said annular body;

wherein said generally annular shaped body comprises two portions, each portion having two ends, one end of each portion being connected by means of a hinge and the other end of each portion forming a lap joint;

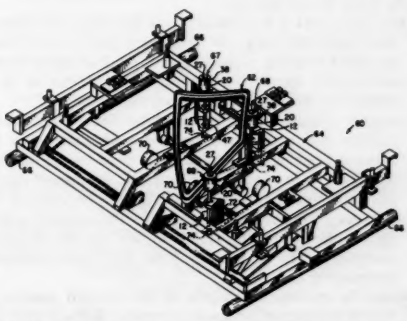
and wherein said lap joint is covered by said displaceable member when said arm is secured to said annular body by said displaceable member.

5,069,046

ROLLER CYLINDER ASSEMBLY FOR PRESS FORMING GLASS SHEETS AND METHOD OF USING

Frank E. Moulding, Allen Park, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 11, 1990, Ser. No. 581,346
Int. Cl.[5] C03B *23/03*
U.S. Cl. 65—106 **6 Claims**



5. A glass fabrication process for treating a heated glass sheet comprising:

heating the glass sheet as it travels through a lehr; and

guiding the glass sheet, at least in part, by contact with a ball bearing roller cylinder assembly comprising:

an elongate center shaft;

a spindle concentric with, and fixed on the free end of, the center shaft, having oppositely facing first and second end surfaces, each in a plane substantially perpendicular to the longitudinal axis of the center shaft;

a freely rotatable roller cylinder housing the spindle and comprising a cylindrical outer skirt concentric with the center shaft, a first end cap cooperating with the first end surface of the spindle to form a first ball bearing race, and a second end cap cooperating with the second end surface of the spindle to form a second ball bearing race; and

a first set of ball bearings disposed between the first end cap and the spindle in the first ball bearing race and a second set of ball bearings disposed between the second end cap and the second end surface of the spindle in the second ball bearing race.

5,069,047

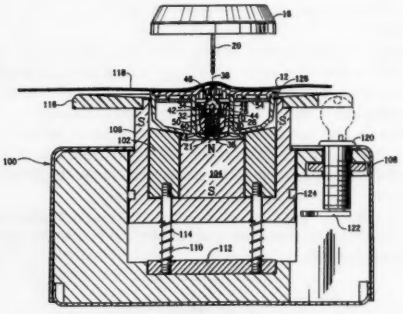
RELEASE OF PIN-CLUTCH MECHANISM IN THEFT-DETERRENT DEVICE

John L. Lynch, Holiday, and Lincoln H. Charlot, Jr., St. Petersburg, both of Fla., assignors to Security Tag Systems, Inc., St. Petersburg, Fla.

Filed Nov. 2, 1990, Ser. No. 608,152

Int. Cl.[5] E05B *65/00*

U.S. Cl. 70—57.1 **16 Claims**



1. An apparatus for releasing locked components of a device of the type that includes means for attaching the device to an article, with said attaching means being embodied in two components that are adapted to be locked together on opposite sides of a portion of said article to prevent unauthorized removal of the device from the article, wherein the attaching means include a pin anchored within one component and a clutch mechanism contained in the other component, the releasing apparatus comprising

a seat for receiving a component of a device that contains a clutch and a ferromagnetic anvil that is positioned to force the clutch to apply pressure against an inserted pin that is anchored in another component of the device so as to restrain the pin from release from the clutch;

a magnet disposed for movement between a protracted position and a retracted position such that when the clutch-containing component is received by the seat and the magnet is in its protracted position, the magnet applies magnetic flux that attracts and thereby repositions the ferromagnetic anvil to thereby relax the pressure applied against the pin by the clutch so that the pin-anchoring component can be released from the clutch-containing component; and

means for moving the magnet to its retracted position, in which the magnet is disposed a greater distance from said seated clutch-containing component than when in its protracted position, whereby when the magnet is in its retracted position, the attraction between the magnet and the ferromagnetic anvil is such that the clutch-containing component can easily be removed from the seat.

5,069,048

AUTOMOBILE STEERING LOCK

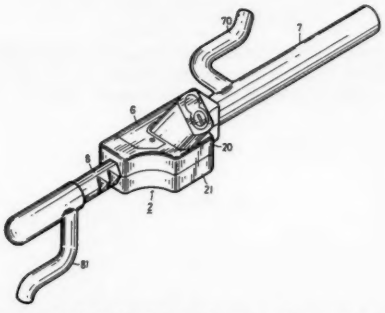
Tsung I Lo, 5th Fl., No. 76, Ai-Kuo E. Road, Taipei, Taiwan

Continuation-in-part of Ser. No. 505,425, Apr. 6, 1990, Pat. No. 5,005,388. This application Jan. 22, 1991, Ser. No. 643,943

The portion of the term of this patent subsequent to Apr. 9, 2008, has been disclaimed.

Int. Cl.[5] B60R *25/02*

U.S. Cl. 70—209 **3 Claims**



1. An antitheft device for attachment to the steering wheel of an automobile comprising:

a) an elongate tubular member having an elongate passageway extending along its longitudinal axis;

b) a first L-shaped member secured to the tubular member and defining a first hook for engaging a first inner portion of a steering wheel;

c) a housing means including two mating halves, a first half having a major side wall grooved with a first trough which extends longitudinally therethrough and is divided into a semi-circular inner section and an isosceles trapezoidal outer section, a first semi-circular groove extending parallel to the first trough, at least a first transverse groove extending across the first semi-circular groove and intersecting the first trough, a second half having a major side wall grooved with a second trough which extends longitudinally therethrough and is divided into a semi-circular inner section and an isosceles trapezoidal outer section, a second semi-circular groove extending parallel to the second trough, at least a second transverse groove extending across the second semi-circular groove and intersecting the second trough and a boss integrally formed on a sidewall opposite to said major side wall of the second half and formed with a bore extending downwardly through the second half, and fasteners firmly fixing the two mating halves together with the grooved major side walls of the first and second halves adjacent each other to define a passageway including a cylindrical inner section defined between the semi-circular inner sections to receive one end of the tubular member to place the elongate passageway of the tubular member in axial alignment with the passageway of the housing means, a cylindrical compartment defined between the first and second semi-circular grooves and at least one transverse passageway defined between the first and second transverse grooves and extending across the cylindrical compartment and intersecting the passageway;

d) a lock means firmly received in the boss of the second half of the housing means and having a locking member extending downwardly along the axis of the bore of the boss and an actuating pin eccentrically attached to a bottom of the locking member;

e) an elongate actuating member slidably disposed in the

cylindrical compartment in the housing means, the actuating member including at least one notch formed therein and defined by a vertical side wall and a sloping side wall and a recess formed in the actuating member, and defined by a stop side wall for engagement by the locking member;

f) a first spring means disposed in the cylindrical compartment for biasing the actuating member;

g) means for securing the lock means to the second half of the housing means, whereby the locking member is rotatable between an unlocked position and a locking position;

h) an elongate rod member provided with a plurality of longitudinally spaced notches and telescopically receivable within the axially aligned passageways of the housing means and the tubular member, and a second L-shaped member secured to the rod member and defining a second hook open in a direction opposite to the first hook for engaging an opposed second inside portion of the steering wheel;

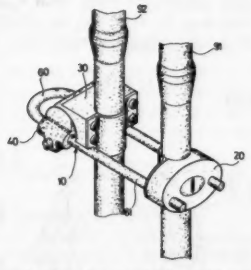
i) a locating member slidably received within the transverse passageway in the housing means, the locating member including an opening sized to receive the actuating member therethrough and positioning the locating member within a notch of the actuating member, and a second spring means disposed in the transverse passageway for urging the locating member towards the passageway of the housing means, whereby when the actuating member is in the locking position, the locating member engages a notch of the rod member, and when the actuating member is in its unlocked position, the locating member is disengaged from the notch of the rod member.

5,069,049

LOCK MECHANISM FOR A CYCLING VEHICLE

Yi C. Shieh, 58, Ma Yuan West Street, Taichung, Taiwan

Filed Nov. 19, 1990, Ser. No. 615,268
Int. Cl.[5] B62H *5/16*
U.S. Cl. 70—227 **1 Claim**



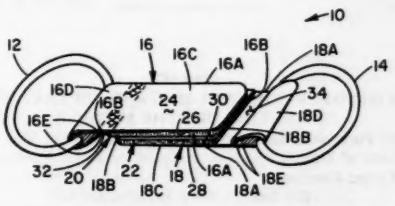
1. A lock mechanism for a vehicle, said vehicle having a wheel rotatably coupled to a fork portion, said fork portion having a pair of limbs; said lock mechanism comprising a latch part and a block fixed to said limbs of said fork portion respectively, an aperture and a recess being formed in parallel in a seat which is integrally fixed to said block; a pair of supports being coupled together by a shaft which is rotatably supported within said aperture so that said supports are rotatable about said shaft, a hole being vertically formed in each of said supports for slidably receiving a pair of legs of a U-shaped frame, a first notch being formed in one of said legs, a key hole being laterally formed in a first support of said supports and being arranged in parallel to an axis of said shaft, said key hole being intersected with said hole of said first support, a distance between said key hole and said shaft being equal to a distance between said aperture and said recess so that said key hole can be aligned with said recess when said supports rotate to a suitable angle, a shoulder being formed in one end of said key hole close to said seat; a spring and a catch being received within said recess; a latch pin which has a key formed on one end portion thereof having an enlarged head engaged with said shoulder when said latch pin is slidably received within said key hole, said latch pin having a second notch; when said key hole is aligned with said recess and when said latch pin and said catch are biased by said spring, a free end of said latch pin extending outward from said key hole, said first notch of said leg being aligned with said latch pin so that said latch pin is movable laterally relative to said leg, said catch being engaged between said seat and said first support so that said supports can not rotate about said shaft, said legs being stably maintained in position in parallel to said limbs so that said wheel is free to rotate; and when said latch pin is depressed into said key hole, said catch being pushed inward and received within said recess so that said supports are rotatable about said shaft, said second notch being aligned with said hole of said first support so that said legs of said frame are slidable along said holes, and a free end of said legs being engageable with said latch part and can be locked by said latch part so that said wheel can not rotate.

5,069,050

KEY HOLDER ASSEMBLY WITH SEPARABLE STRAPS OF COMPLEMENTARY HOOK AND LOOP FASTENING MATERIALS

Nathan Chen, Huntingbeach, Calif., assignor to Perfect Fastener, Inc., Huntington Beach, Calif.

Filed May 1, 1991, Ser. No. 694,432
Int. Cl.[5] A47G *29/10*
U.S. Cl. 70—456 R **11 Claims**



1. A key holder assembly, comprising:

(a) a pair of key-holding elements;

(b) a pair of mounting straps each having opposite surfaces; and

(c) a pair of patches of complementary hook and loop fastening materials detachably attachable together and being applied on one of said surfaces of said respective straps over substantially the entire length and width of said straps;

(d) each of said straps having a main portion and an end portion, said end portion being folded around one of said key-holding elements and back upon itself so as to provide overlapped sections in which an end portion of said patch on said strap is covered over whereas the remaining portion of said patch on the remaining nonoverlapped main portion of said strap is exposed for attachment;

(e) said overlapped sections of each strap end portion containing a zone in which said overlapped sections are permanently sealed to one another.

5,069,051

METHOD AND APPARATUS FOR FORMING THREADS ON A SLEEVE INNER WALL

Benjamin Olah, Hacienda Heights, Calif., assignor to California Industrial Products, Inc., Santa Fe Springs, Calif.

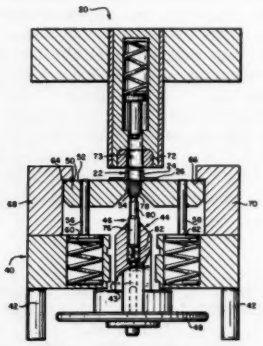
Filed Sep. 7, 1990, Ser. No. 578,466
Int. Cl.[5] B21D *53/24*
U.S. Cl. 72—68 **9 Claims**

1. Method of making a threaded sleeve, comprising the steps of:

forming a sleeve having a bore of oversize diameter;

locating the sleeve on the shank of a tap behind the tap threads;

radially compressing the sleeve about the tap shank until the sleeve bore diameter is less than the tap threads outer diameter; and



rotating the tap while forcing the sleeve toward the tap threads to first form threads on the sleeve and then remove the sleeve off the tap threads.

5,069,052

METHOD FOR ROLL FORMING AND APPARATUS FOR CARRYING OUT THE METHOD

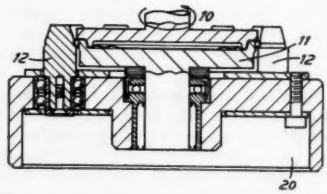
Paul Porucznik, Kennington, and Keith Longstaff, Worcester, both of United Kingdom, assignors to CMB Foodcan plc, United Kingdom

Filed Jun. 21, 1989, Ser. No. 369,469

Claims priority, application United Kingdom, Jun. 23, 1988, 8814938

Int. Cl.[5] B21D *22/14*

U.S. Cl. 72—84 **8 Claims**



7. A method for reforming an end wall of a container, said method comprising the steps of

(a) clamping the end wall between a first pressure plate and a second pressure plate so that said plates and end wall are in axial alignment and a peripheral portion of the end wall protrudes at least around the second plate;

(b) entering the clamped end wall into an array of freely rotatable rolls, which are mounted in a housing and each of which has a profiled work surface, to progressively reform the protruding portion of the end wall while causing the pressure plates with the end wall clamped between them to rotate while the housing is stationary;

(c) thereafter removing the assembly of reformed end wall and plates from the array; and

(d) parting the pressure plates to release the reformed end wall.

5,069,053

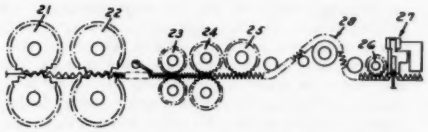
METHOD AND APPARATUS FOR CUTTING CORRUGATED WEBS

Bernard J. Wallis, 2215 Dacosta, Dearborn, Mich. 48128

Filed Jun. 5, 1989, Ser. No. 361,423

Int. Cl.[5] B21D *13/04*

U.S. Cl. 72—185 **11 Claims**



1. In the method of continuously forming a corrugated web from a flat strip wherein the web is continuously moved between forming rollers and thereafter to a cutting position wherein predetermined length of corrugated web is severed from corrugated web, the improvement comprising

interrupting the movement momentarily of the corrugated web at a cutting station while continuing to form the flat strip so that the upstream formed portion of the web is accumulated during the interruption in the movement,

moving the corrugations relative to one another to locate an apex of a corrugation to be cut and

cutting the corrugation of the located apex,

said step of locating the corrugation comprising engaging the apices of the corrugations on one side of the web opposite to the apex to be cut and spreading these corrugations such that the cutting can be achieved through the opposed apex.

5,069,054

ROLLING MACHINE WITH QUICK CHANGE WORKING ROLLS

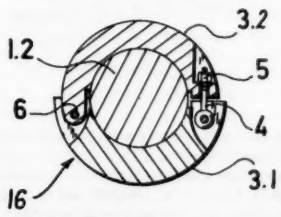
Vaclav Hladky, Brno, and Jiri Prokes, Rosice u Brna, both of Czechoslovakia, assignors to Form, Brno, Czechoslovakia

Filed Aug. 29, 1989, Ser. No. 399,897

Claims priority, application Czechoslovakia, Aug. 31, 1988, 5860-88

Int. Cl.[5] B21B *35/14*

U.S. Cl. 72—238 **9 Claims**



1. A rolling machine with a quickly removable and replaceable working roll, the rolling machine having a driving mechanism provided with a driving shaft, a supporting and guiding mechanism provided with a supporting trunnion and a removable working roll for supporting tools, the removable working roll being provided at least at one end with an angular trunnion supported within a first divided clamping part, the first divided clamping part having a stable clamping portion and a mobile clamping portion, said mobile clamping portion of the first divided clamping part being removably connected with the stable clamping portion by at least one threaded fastener, the other end of the working roll having a trunnion also supported within a second divided clamping part, said second divided clamping part also having a stable clamping portion and a mobile clamping portion, the latter mobile clamping portion of

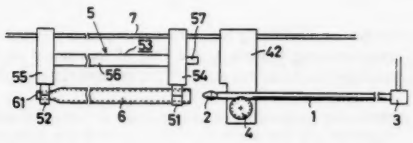
the second divided clamping part being connected with the stable clamping portion by at least one threaded fastener.

5,069,055

AUTOMATIC PLUG-INSERTING APPARATUS IN A PIPE-DRAWING EQUIPMENT

Noboru Ohneda, Oyamashi; Shunta Ushioda, Yukishi; Haruo Arima, Oyamashi; Ichiro Hashimoto, Oyamashi; Denziro Kaneko, Tochigishi, Kazuo Sugiyama, Shimodateshi, Tsuguo Fukazawa, Oyamashi, Teruo Tachi, Kasa Mashi; Takashi Mukasa, Ykishi, all of Japan, assignors to Showa Aluminum Kabushiki Kaisha, Osaka, Japan

Filed Oct. 25, 1990, Ser. No. 603,127
Claims priority, application Japan, Nov. 6, 1989, 1-288528
Int. Cl.[5] B21C *1/32*
U.S. Cl. 72—283 **2 Claims**



1. An automatic plug-inserting apparatus in a pipe-drawing equipment, the apparatus comprising:

a plug supporting rod fixed at one end to a support means;

a plug secured to an opposite end of the plug-supporting rod;

a support roller for supporting an intermediate portion by rollably engaging a bottom surface of the plug supporting rod of the plug-supporting rod;

the support roller being freely movable along a path in a direction of an axis of and in parallel with the plug-supporting rod;

a pipe-transporting device for moving a raw pipe which is to be drawn, towards the plug-supporting rod having the axis in alignment with an axis of the raw pipe;

the pipe-transporting device fixedly gripping both ends of the raw pipe into which the plug is to be inserted so that the pipe can be moved along the axis while the pipe is gripped;

a pushing means attached to the pipe-transporting device; and

the pushing means pushing and starting to carry the support roller along the path in rolling engagement with said bottom surface towards the fixed end of the plug-supporting rod before a leading end of the raw pipe goes beyond the support roller as the pipe-transporting device moves along the axis.

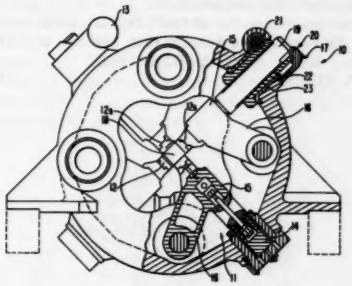
5,069,056

SIMPLIFIED HYDRAULIC FORGING MACHINE

Antonino Durì, Pradamano, Italy, assignor to Danieli & C. Officine Meccaniche SPA, Pradamano, Italy

Filed Nov. 7, 1990, Ser. No. 609,766
Claims priority, application Italy, Nov. 24, 1989, 83515 A/89
Int. Cl.[5] B21D *41/00*
U.S. Cl. 72—400 **3 Claims**

1. Simplified hydraulic forging machine having four hammers arranged substantially symmetrically, two of the hammers below and two above a horizontal plane passing through the center of forging, each the hammers being supported by a hammer support, the forging machine being characterized in that the two upper hammers during the forging operation are



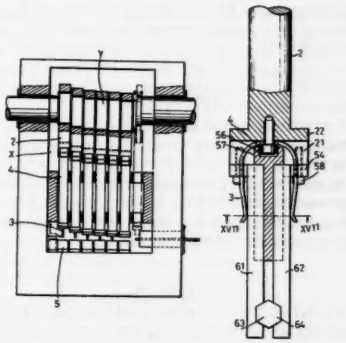
stationary, whereas the two lower hammers move to forge a workpiece during the forging operation.

5,069,057

PUNCH PRESS WITH INDEPENDENTLY OPERATED PRESSING UNITS DRIVEN BY A CRANKSHAFT

Yuan-Ho Lee, Tainan Hsieng, Taiwan, assignor to San Shing Hardware Works Co., Ltd., Tainan Hsieng, Taiwan

Filed Dec. 29, 1998, Ser. No. 459,312
Int. Cl.[5] B21D *43/10*
U.S. Cl. 72—405 **10 Claims**



1. A punch press includes a frame, a crankshaft, a plurality of punching units, a ram unit mounted slidably on said frame so as to carry said punching units, a couples unit connecting said ram unit to said crankshaft, a bed, a plurality of dies disposed on said bed, and a workpiece gripping device adapted to carry and move workpieces between said dies, wherein said crankshaft comprises a plurality of angularly spaced eccentric sections having different eccentric angles, said coupler unit including a plurality of couplers respectively and rotatably connected to said eccentric sections of said crankshaft, said ram unit including a plurality of slides respectively and rotatably connected to said couplers so as to impel said punching units, said workpiece gripping device including a plurality of separate gripping units respectively arranged in association with one of said punching units so as to constitute a plurality of punch pressing units, one of which includes one of said eccentric sections of said crankshaft, one of said couplers, one of said slides, one of said punching units and one of said gripping units, wherein said crankshaft having said eccentric sections at different eccentric angles drives only one punch pressing unit at a time such that each of said punch pressing units perform an independent operation.

5,069,058

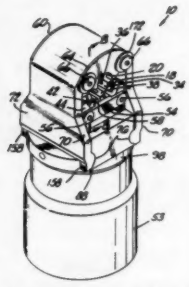
SWAGING TOOL

Arthur J. Hyatt, Torrance, Calif., assignor to Deutsch Metal Components, Los Angeles, Calif.

Continuation of Ser. No. 291,003, Dec. 27, 1988, abandoned. This application Feb. 28, 1990, Ser. No. 492,282

Int. Cl.[5] B21D *39/00*

U.S. Cl. 72—413 **27 Claims**



1. A swaging tool, comprising:

a first die;

a second die adapted to be moved toward the first die to swage a workpiece therebetween;

a head for holding the first die with respect to the second die during swaging;

a cylinder for supporting the second die and having means for moving the second die toward the first die;

connecting means for connecting the head to the cylinder, the connecting means comprising a pair of tongues on the head adapted to be moved into sliding engagement with a pair of grooves on the cylinder, the tongues and grooves extending in a direction substantially transverse to the longitudinal axis of the cylinder; and

head alignment means associated with one of the tongues and its corresponding groove for preventing reversal of the orientation of the first die with respect to the second die and thereby properly aligning the dies in the same orientation each time the head is connected to the cylinder, such that the head may be connected to the cylinder from either side of the cylinder.

5,069,059

POSITIONING DEVICE FOR ARRANGING ELONGATED WORKPIECES AND THE USE OF SUCH A DEVICE IN A WIRE-WORKING MACHINE

Gerhard Lange, Reutlingen, Fed. Rep. of Germany, assignor to WAFIOS Maschinenfabrik GmbH & Co. Kommanditgesellschaft, Fed. Rep. of Germany

Filed Jun. 28, 1990, Ser. No. 544,928

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1989, 3922529

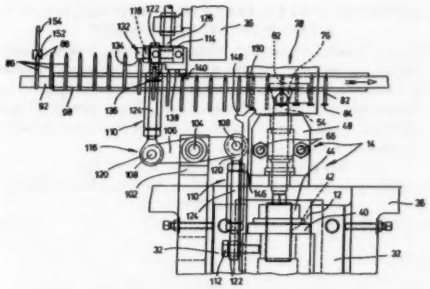
Int. Cl.[5] B21D *43/02;* **B21G** *3/20*

U.S. Cl. 72—421 **2 Claims**

1. A positioning device for arranging elongated workpieces such as wire pieces each having an axial direction along their respective axes, said workpieces being successively movable perpendicular to their parallel axes from one working station to another working station and being displaceable in batches during movement between the two stations, said workpieces each having a worked end and an unimpacted end, comprising:

at least one positioning tool for displacing at least one workpiece in the axial direction of said at least one workpiece by a predetermined distance, said tool being a rigid body which is displaceable parallel to the axial direction of the workpiece to be displaced between the two working stations independent of lateral guiding perpendicular to said axial direction;

wherein the positioning tool, which is rigid in itself, has at least two working surfaces which are displaceable parallel to the axial directions of the workpieces and one of which, in the course of the working stroke of said positioning tool, acts upon and carries with it the end of a workpiece lying in its path;



wherein the positioning tool which is disposed between said two working stations at the line of movement of said workpieces is without stop for the unimpacted end of the workpiece acted upon; and

wherein the positioning tool has at least one step connecting together and two working surfaces which are adjacent.

5,069,060

METHOD OF OPERATING PRESS MACHINE AND SERVO CONTROLLER THEREFOR

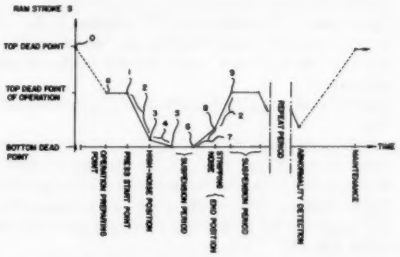
Mitoshi Ishii, 1-3, Higashiohmichi, 2-chome, Ohita-shi, Ohita, Japan

Continuation-in-part of Ser. No. 245,476, Aug. 24, 1988, abandoned. This application Jun. 25, 1990, Ser. No. 542,556

Claims priority, application Japan, Dec. 29, 1986, 61-310994

Int. Cl.[5] B21J *7/46*

U.S. Cl. 72—443 **6 Claims**



1. A method of operating a press machine by controlling speed of a tool held by a moving ram of the press machine comprising the steps of:

moving said tool at an initial speed toward a workpiece until the completion of working;

controlling said tool at a suspension speed so as to stay substantailly still for a period of between 0.05 and 2 seconds immediately after the completion of working said workpiece so that air flow into a space between said tool and said workpiece which has been worked on to smoothly separate said workpiece from said tool to thereby prevent said workpiece from being damaged; and

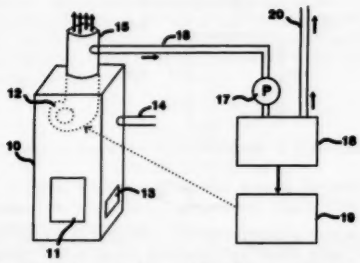
controlling said tool, in one cycle of the moving ram, to be at a retrievign speed when said tool leaves said workpiece, wherein said step of controlling said tool at said suspension speed occurs prior to said step of controlling said tool to be at said retrieving speed.

5,069,061

ESTIMATION OF FUMIGANT RESIDUES IN COMMODITIES

Charles R. Sell, and Mark A. Weiss, both of Yakima, Wash., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Dec. 29, 1989, Ser. No. 459,405
Int. Cl.[5] G01N 7/00
U.S. Cl. 73—19.01 8 Claims



1. A method for reducing residual fumigant to a desirable level in a commodity in a fumigation chamber having a free air space therein, comprising:

(a) determining the weight of said commodity in said chamber;

(b) passing a gas through said chamber in first and second phases to remove fumigant; wherein said free air space is depleted of fumigant and residual fumigant is released from said commodity during said first phase; wherein residual fumigant in said commodity is further released therefrom during said second phase; wherein said gas is passed through said chamber during said second phase at a known volumetric flow rate;

(c) determining the rate of decline of fumigant in gas exiting from said chamber during said second phase, so that there is a continual or intermittent update of the rate of decline;

(d) determining the concentration of fumigant in gas exiting from said chamber at the beginning of said first phase that is due to fumigant released from said commodity;

(e) continuing said second phase at least until said desirable level of residual fumigant in said commodity is reached as estimated from a predetermined relationship between:

(i) said weight,

(ii) said volumetric flow rate,

(iii) said concentration of fumigant in exit gas at the beginning of said first phase that is due to fumigant released from said commodity;

(iv) the latest update of said rate of decline of fumigant in exit gas;

(v) the length of time between the beginning of said first phase and said latest update of the rate of decline.

5,069,062

FLUID DAM AND PRESSURE TESTER APPARATUS AND METHOD OF USE

Edward L. Malecek, Delano, and Charles H. Ramberg, Dayton, both of Minn., assignors to Arctic Fox Heaters, Inc., Minneapolis, Minn.

Filed Sep. 28, 1990, Ser. No. 588,500
Int. Cl.[5] G01M 3/26
U.S. Cl. 73—49.7 16 Claims

15. A method for retaining coolant in an engine cooling system while component replacements or repairs are made to the cooling system, for pressure testing the cooling system after completion of repairs, and for utilizing a combination pressure and vacuum apparatus, comprising the steps of:

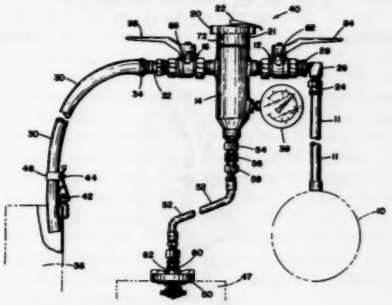
a) providing a pressure and vacuum apparatus having a main housing with walls defining an internal chamber, an inlet conduit and an outlet conduit each constructed for providing flow through passage of a pressurized medium through said main housing internal chamber;

b) removing a radiator cap from an engine coolant fill neck;

c) installing the pressure and vacuum apparatus on the fill neck so that coolant within the engine radiator is in communication with the main housing internal chamber;

d) securing a discharge hose extending from said pressure and vacuum apparatus outlet conduit to a fixture;

e) locking a self-locking radiator cap onto a top end of said pressure and vacuum apparatus;



f) closing a flow control valve;

h) opening a pressure gate valve;

i) attaching a pressurized medium supply source hose to said flow control valve; and

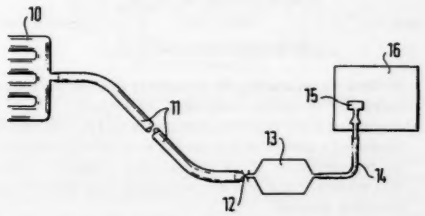
j) opening said flow control valve to permit flow of a pressurized medium from said flow control valve through said pressure gate valve to create a coolant retaining vacuum within the pressure and vacuum apparatus to and during repair and maintenance of the engine cooling system.

5,069,063

DEVICE FOR MEASURING A PULSATING VARIABLE IN AN INTERNAL COMBUSTION ENGINE

Martin Chrobaczek, Wiesentalstrassé 1c, D-7000 Stuttgart 70; Helmut Denz, Augustenstrasse 41, D-7000 Stuttgart 10; Andreas Roth, Horrheimer Strasse 15, D-7143 Vaihingen/Enz, and Hans Heim, Weidenbrunnen 91B, D-7000 Stuttgart 50, all of Fed. Rep. of Germany

PCT No. PCT/DE89/00062, § 371 Date Jul. 11, 1990, § 102(e) Date Jul. 11, 1990, PCT Pub. No. WO89/07241, PCT Pub. Date Aug. 10, 1989
PCT Filed Feb. 2, 1989, Ser. No. 536,619
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1988, 3803276
Int. Cl.[5] G01M 15/00
U.S. Cl. 73—118.2 14 Claims



1. A device for detecting a pulsating variable in an internal combustion engine, comprising at least one of filtering means and damping means; a sensor connected with said at least one of filtering means and damping means for sensing the pulsating variable; and means arranged downstream of said sensor and connected therewith for sampling a measurement value of the

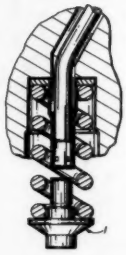
pulsating variable every half-period of the pulsation variable in synchronization with an engine crankshaft angle, and for forming a mean value of the pulsating variable from two measurement values per period.

5,069,064

MAGNET ATTACHMENT TO SPRING SEAT OF FUEL INJECTION APPARATUS

George D. Wolff, P.O. Box 9407, Winter Haven, Fla. 33883

Filed Jul. 12, 1990, Ser. No. 551,278
Int. Cl.[5] G01M *15/00*
U.S. Cl. 73—119 A **11 Claims**



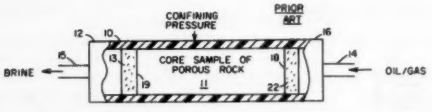
1. A spring seat assembly for coupling to a spring in a fuel injection apparatus of an internal combustion engine, said spring seat assembly comprising:
- a magnetically transparent cap having a rim which terminates in a cylindrical extension;
- a magnet attached to the magnetically transparent cap;
- attachments means for securing said magnet in said cap; and
- a spring seat attached to the magnet and transmitting forces through the cap to the spring positioned in the fuel injector apparatus.

5,069,065

METHOD FOR MEASURING WETTABILITY OF POROUS ROCK

Eve S. Sprunt, Farmers Branch, and Samuel H. Collins, DeSoto, both of Tex., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Jan. 16, 1991, Ser. No. 641,965
Int. Cl.[5] E21B *49/00*
U.S. Cl. 73—153 **11 Claims**



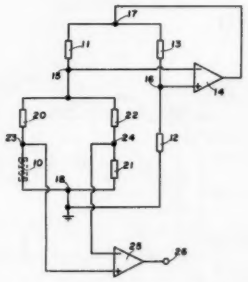
1. Method for measuring the wettability of a porous rock of a subterranean formation, comprising the steps of:
- a) measuring a first capillary pressure on said porous rock by saturating a sample of said porous rock having a wettability representative of the subterranean formation with a first medium phase and displacing said first medium with a second medium,
- b) measuring a second capillary pressure on said porous rock by injecting mercury into an evacuated sample of said porous rock, and
- c) determining wettability of said porous rock as a function of the ratio of said first and second capillary pressure measurements.

5,069,066

CONSTANT TEMPERATURE ANEMOMETER

Robert S. Djorup, 20 Lovewell Rd., Wellesley, Mass. 02181

Filed May 10, 1990, Ser. No. 521,594
Int. Cl.[5] G01F *1/68;* **G01P** *5/10*
U.S. Cl. 73—204.15 **9 Claims**



1. In a constant temperature anemometer of the type having bridge circuit means with feedback circuit means operatively connected to said bridge circuit means,
- a Wheatstone bridge operatively connected as one arm of said bridge circuit means, said Wheatstone bridge comprising a single non-zero temperature coefficient resistive anemometer sensing element together with two fixed resistors and an ambient temperature sensing resistor, one end of said sensing resistor being operatively connected to said anemometer sensing element such that said sensing resistor is not in series with said anemometer sensing element, and
- a second ambient temperature sensing resistor operatively connected as one arm of said bridge circuit means, one end of said second sensing resistor being operatively connected to said Wheatstone bridge,

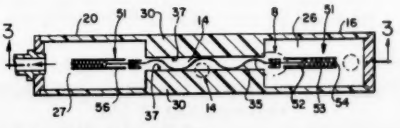
wherein a signal output is taken by a differential amplifier operatively connected across said Wheatstone bridge.

5,069,067

FLUID FLOW METER

Dov Ingman, Haifa, Israel, assignor to Select Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 212,955, Jun. 29, 1988. This application Apr. 26, 1990, Ser. No. 515,069
Claims priority, application Israel, Jun. 10, 1988, 86705
Int. Cl.[5] G01F *1/54, 3/00*
U.S. Cl. 73—269 **24 Claims**



1. A fluid flow meter, comprising:
- a housing having a pair of fluid ports and defining a fluid flow path therebetween;
- a flexible membrane extending lengthwise in the direction of fluid flow and mounted for flexure at opposing longitudinal ends of the membrane within the housing, said membrane having a pair of opposing faces and two opposite side edges extending generally in the direction of fluid flow mounted in the fluid flow path such that the side edges form seals with said housing, and the pair of faces simultaneously define with the housing fluid impermeable seals at least two different locations along the flow path operative to flex so as to permit passage of discrete quanta

of fluid, each quantum of fluid having a known volume varying as a function of flow rate;

at least one elongated resilient member disposed within said membrane forming a plurality of lines of resilience extending between said longitudinal ends of said membrane in the direction of said fluid flow path for providing the membrane with resilience for undulation of flexing;

means for generating electrical signals corresponding to flexure of said membrane; and

monitoring means for receiving the electrical signals from said means for generating electrical signals over a period of time determining the rate of said electric signals, determining the volume of said quanta based upon said electrical signal rate, and thereby determining a fluid flow rate along said flow path.

5,069,068

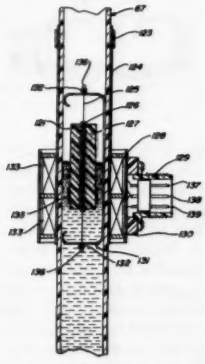
FLUID LEVEL MAINTENANCE SENSOR FOR USE IN A TANK TEST SYSTEM

Allan S. Jacob, Rochester Hills, and Andrzej Zawadzki, Birmingham, both of Mich., assignors to Heath Consultants Incorporated, Stoughton, Mass.

Division of Ser. No. 174,762, Mar. 29, 1988, Pat. No. 4,954,973. This application Jun. 8, 1990, Ser. No. 534,972

Int. Cl.[5] G01F *23/56, 23/62*

U.S. Cl. 73—313 **2 Claims**



1. A level sensor for maintaining the level of fluid in a vertical level sensing tube comprising:

(a) a dual coil bobbin mounted on the level sensing tube having an upper portion and a lower portion;

(b) an upper sensor coil winding having a pair of leads mounted on the upper portion of said dual coil bobbin;

(c) a lower sensor coil winding having a pair of leads mounted on the lower portion of said dual coil bobbin;

(d) a shield mounted around said dual coil bobbin;

(e) a non-magnetic bracket mounted in the level sensing tube;

(f) said non-magnetic bracket having an upper end disposed above the fluid level in the level sensing tube, and a lower end disposed below the fluid level in the level sensing tube;

(g) a monofilament line mounted in tension between said non-magnetic bracket upper and lower ends;

(h) a float, made from a non-absorbent material, having an axial opening therethrough for the slidable reception and mounting of the float on the monofilament line;

(i) a ferromagnetic ring mounted about the circumference of the float;

(j) an insulator block mounted on said shield;

(k) an electrical connector member mounted on the insulator block and having an upper contact connected to one lead from the upper sensor coil winding, a lower contact connected to one lead from the lower sensor coil winding, and a center contact connected to the other lead of each of the sensor coil windings;

(l) the upper, lower and center contacts are adapted to be connected to a source of electrical energy during use to energize the coil windings;

(m) the ferromagnetic ring is disposed about the circumference of the float at an exact center set point position between the upper and lower sensor coil windings when the fluid in the level sensing tube is at an exact selected level, whereby if the fluid level in the level sensing tube rises above said set point position of the ferromagnetic ring, the float and the ferromagnetic ring will move upwardly above the set point position into the upper sensor coil winding and a signal will be induced in the upper sensor coil winding and sent to a fluid level transfer means to transfer fluid out of the level sensing tube to cause the float and ferromagnetic ring to move down and return to the set point position, and if the fluid level in the level sensing tube falls below said set point position of the ferromagnetic ring, the float and the ferromagnetic ring will move below the set point position into the lower sensor coil winding and a signal will be induced in the lower sensor coil winding and sent to the fluid transfer means to transfer fluid into the level sensing tube to cause the float and the ferromagnetic ring to move up and return to the set point position.

5,069,069

MOISTURE-SENSITIVE ELEMENT FOR MOISTURE SENSORS

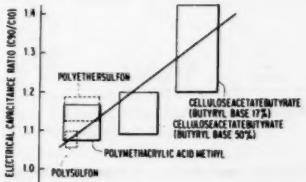
Tetsuya Miyagishi, Fujisawa; Toru Abe, Yokohama, and Takaaki Kuroiwa, Odawara, all of Japan, assignors to Yamatake-Honeywell Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1990, Ser. No. 515,096

Claims priority, application Japan, Apr. 26, 1989, 1-104594; Apr. 27, 1989, 1-105871

Int. Cl.[5] H01G *5/20;* **G01N** *25/64*

U.S. Cl. 73—335 **19 Claims**



10. A sensor for sensing moisture in an atmosphere comprising in combination:

a first conductor;

a film disposed on said first conductor composed principally of a polymer with a water sorption capacity in a range between 10 and 40 milligrams of water per gram of polymer at a temperature of 30° C. and a relative humidity of 90% RH;

a second conductor disposed on said film; and

means to couple said first and second conductors to a source of electrical energy whereby the moisture in said atmosphere can be sensed by detecting a change in an electrical property of said film.

5,069,070

METHOD FOR DETERMINING THE ALCOHOL CONTENT AND/OR THE CALORIFIC VALUE OF FUELS VIA PROPAGATION PARAMETERS

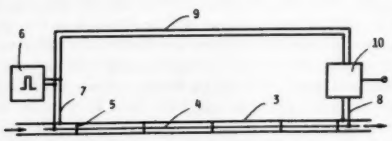
Günter Schmitz, Aachen, Fed. Rep. of Germany, assignor to FEV Motorentechnik GmbH KG, Aachen, Fed. Rep. of Germany

Filed Dec. 6, 1989, Ser. No. 446,781

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1988, 3841471

Int. Cl.[5] G01H *5/00*

U.S. Cl. 73—597 6 Claims



1. A method for determining an alcohol content and calorific value of a fuel, comprising the steps of:

providing a hollow electrically terminated waveguide for the fuel;

producing an electromagnetic wave having a defined frequency in the waveguide filled with the fuel;

measuring a phase velocity of the electromagnetic wave where the phase velocity is defined as the product of the frequency and twice the distance between two voltage maxima of a standing wave in the waveguide; and

comparing the measured phase velocity with a reference standard phase velocity previously measured in said hollow waveguide; and

calculating the alcohol content and calorific value from the velocity ratio.

5,069,071

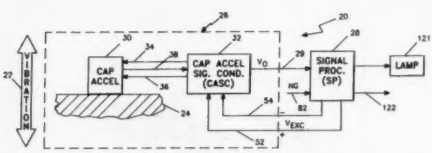
VIBRATION MONITORING IN THE FREQUENCY DOMAIN WITH A CAPACITIVE ACCELEROMETER

Gregory J. McBrien, Cromwell; Anthony N. Martin, Simsbury, and Douglas P. Modeen, Granby, all of, assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 27, 1990, Ser. No. 572,838

Int. Cl.[5] G01H *11/06;* G01P *15/125*

U.S. Cl. 73—654 23 Claims



1. A vibration monitoring system for determining the amount of energy at a certain frequency within a vibration signal spectrum of a mass, comprising:

capacitive accelerometer means, disposed to be mounted to or rigidly coupled to the mass, and having two or more electrically conducting surfaces separated by a dielectric material, for producing a time varying change in capacitance between said electrically conducting surfaces in response to vibration of the mass, for mixing said time varying change in capacitance and a variable frequency signal by applying said variable frequency signal which is an AC voltage across said conducting surfaces, and for providing a mixed signal indicative of the product of said mixing, such that the frequency spectrum of said mixed signal comprises a certain beat frequency whose energy is indicative of the amount of energy at the certain frequency within the vibration signal spectrum of the mass;

a bandpass filter, responsive to said mixed signal, having a passband centered about a certain center frequency, for filtering said mixed signal and for providing a filtered signal indicative thereof; and

frequency control means, for providing said variable frequency signal, for setting the frequency of said variable frequency signal such that the location of said certain beat frequency created by said mixing and associated with the certain frequency of the vibration signal spectrum is within said passband, and being responsive to said filtered signal for providing an energy signal whose energy is a measure of the vibration energy associated with the certain frequency.

5,069,072

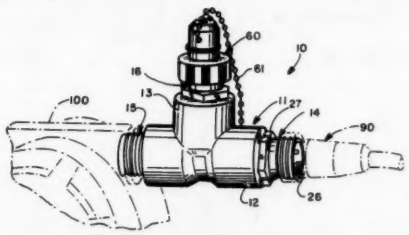
CONNECTOR MODULE FOR TRANSDUCER

Donald J. Taylor; Anthony G. Zumo, both of Baton Rouge, La., and John R. Bussema, Villa Park, Ill., assignors to Woodhead Industries, Inc., Northbrook, Ill.

Filed Jul. 26, 1990, Ser. No. 557,756

Int. Cl.[5] G01L *9/00*

U.S. Cl. 73—756 18 Claims



1. In combination with a sensing device connected to a power source, a connector module connected between the sensing device and the power source, said module comprising: a housing providing a source port, an outlet port, and a test port, said source port including a plurality of connector elements adapted to be connected to said power source, said test port including a plurality of connector elements; means for mounting said outlet port to said sensing device; a plurality of first conductors, one connected to each connector element of said source port, one of said first plurality of conductors being connected to one of the connector elements of said test port; a continuation conductor connected to a second connector element of said test port, said continuation connector and the others of said plurality of conductors being connected to said sensing device, such that power is fed from the power source to the sensing device through said module; and a cap adapted to be assembled to said test port, said cap having first and second connector elements in electrical continuity with each other and adapted to connect said first and second connector elements of said test port together when said cap is assembled to said test port, said cap being removable from said test port thereby interrupting the power fed from the power source to the sensing device and permitting an instrument to be connected to said test port for in-line testing the sensing device.

5,069,073

APPARATUS FOR DIFFUSING HIGH PRESSURE FLUID FLOW

Phillip L. Barrett, Stilwell, Kans., assignor to T.D.F. Partnership, Kansas City, Kans.

Filed Mar. 7, 1990, Ser. No. 489,698

Int. Cl.[5] G01F *1/46;* G01L *7/00*

U.S. Cl. 73—756 12 Claims

5. An apparatus for measuring the pressure of a stream of high pressure fluid comprising:

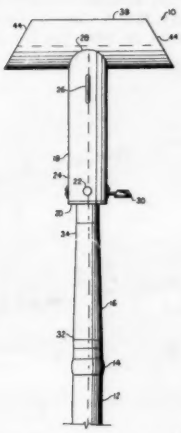
(a) a discharge pipe having two ends;

(b) an inlet pipe fixed to said discharge pipe such that said

inlet pipe is perpendicular to said discharge pipe and an interior passageway in both said pipes are in fluid communication with one another;

(c) means for measuring the pressure of a fluid flowing through said inlet pipe, said means being positioned within said inlet pipe,

(d) said pressure measuring means further comprising a pitot tube;



(e) means for mounting said pitot tube within said inlet pipe and a pitot tube static line connected to said pitot tube and in fluid communication with the exterior of said inlet pipe; and

(f) a cylindrical rod transversely mounted within said inlet pipe, a longitudinal bore within said cylindrical rod in fluid communication with the exterior of said inlet pipe, a pitot tube bore perpendicular to and intersecting said longitudinal bore wherein said pitot tube is mounted.

5,069,074

APPARATUS AND METHOD FOR MEASURING THE MASS FLOW RATE OF MATERIAL FLOWING THROUGH AT LEAST ONE VIBRATING CONDUIT

Alan M. Young, Los Gatos, and E. Ronald Blake, San Jose, both of Calif., assignors to Exac Corporation, San Jose, Calif.

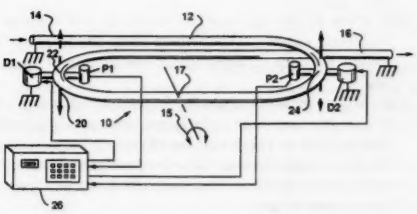
Continuation-in-part of Ser. No. 76,512, Jul. 22, 1987, Pat. No. 4,914,956. This application Jul. 10, 1989, Ser. No. 377,400

Claims priority, application European Pat. Off., Jul. 9, 1988, 88111003.5

The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.

Int. Cl.[5] G01F *1/84*

U.S. Cl. 73—861.38 **14 Claims**



1. Apparatus for measuring the mass flow rate of material flowing through at least one vibrating conduit (**10**), comprising:

a pair of driving means (D_1, D_2) for imparting differential oscillatory motion at separate points (**22**, **24**) along the conduit (**10**);

a pair of motion detectors (P_1, P_2) disposed at separate points (**22**, **24**) along the conduit (**10**) for detecting motion thereof and for developing first and second motion responsive analog voltage signals (V_1, V_2);

differencing means (**30**, U_3) responsive to said first and second analog voltage signals (V_1, V_2) and operative to generate a difference signal (V_3) which is proportional to the voltage difference therebetween;

summing means (**32**, U_4) responsive to said first and second analog voltage signals (V_1, V_2) and operative to generate a sum signal (V_4) which is proportional to the sum of the voltages thereof;

integrating means (**34**, U_5) for integrating said sum signal (V_4); and

dividing means (**36**, U_{11}**14** U_{14}, MP) for dividing the integrated sum (V_5) by said difference signal (V_3) to develop an output signal (V_6) proportional to the mass flow rate of material flowing through said conduit (**10**).

5,069,075

MASS FLOW METER WORKING ON THE CORIOLIS PRINCIPLE

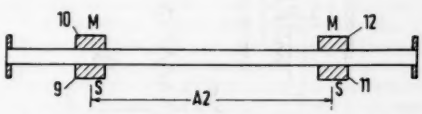
Henning M. Hansen, and Frands W. Voss, both of Sønderborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Jul. 3, 1990, Ser. No. 548,241

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1989, 3923409

Int. Cl.[5] G01F *1/66*

U.S. Cl. 73—861.38 **13 Claims**



1. A mass flow meter working on the Coriolis principle, comprising, at least one measuring tube for having fluid flow therethrough in a fluid flow direction, oscillation exciter means for oscillating the tube to generate waves to travel along the tube in both directions, and oscillation detector and evaluator means for detecting the speed of travel of the waves in both said directions to determine the mass flow of fluid through the tube.

5,069,076

LINEAR ACTUATOR

Dov Rosenthal, Tel Aviv, Israel, assignor to De Haan Mechatronics B.V., Musselkanaal, Netherlands

Filed Aug. 3, 1989, Ser. No. 388,978

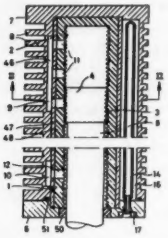
Claims priority, application Netherlands, Aug. 4, 1988, 8801948

Int. Cl.[5] F16H *27/02*

U.S. Cl. 74—89.15 **13 Claims**

1. A linear actuator comprising a housing with cylindrical bore with internal screw thread means and accommodating therein a screw means with external screw thread means in engagement with said screw thread in the housing, whereby through turning of one of these parts relative tot he other an axial displacement relative tot each other also takes place, the screw means being connected to a rod extending beyond the housing, the housing and rod having means for connecting them to parts which can be moved in linear fashion relative to teach other, and to means for rotation of rod and housing relative to each other for obtaining the linear movement, a space in the housing forming part of a space which is sealed to the outside and adapted to contain a liquid lubricant, and

wherein the space sealed to the outside contain at least one space outside the bore, said space outside the bore being connected to the space inside the bore by apertures in the wall of the housing.



5,069,077

ACTUATING MECHANISM FOR A VACUUM-TYPE INTERRUPTER WITH A CONTACT SPRING

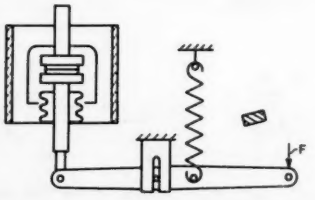
Dietrich Rudolph, and Norbert Steinemer, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 10, 1990, Ser. No. 521,373

Claims priority, application Fed. Rep. of Germany, May 11, 1989, 3915522

Int. Cl.[5] H01H *33/66, 3/46*

U.S. Cl. 74—102 **6 Claims**



1. An actuating mechanism for switching on and off a vacuum-type interrupter of the type having a stationary contact element and a movable contact element connected with an impacting rod which is linearly displaceable and which carries the movable contact element, comprising:

a lever for accommodating an actuating force which is applied at at least one site for closing the contact elements of the vacuum-type interrupter, said lever further having an abutment to accommodate at least one spring element;

a joint for pivotally connecting the impacting rod to the lever;

a bearing associated with the lever and about which the lever can pivot, said bearing having a bolt, and a guide having an end for accommodating the bearing bolt, said guide allowing movement of the bearing bolt along a line generally parallel to a direction in which the impacting rod is displaceable;

said at least one spring element arranged to connect the lever to a stationary abutment and providing a force for maintaining the contact elements of the interrupter in an open position when no external actuating force is applied to the lever, and which further serves to maintain the bearing bolt in a position in which it abuts the one end of the guide;

whereby depending upon the relative locations along the lever of the bearing bolt, the joint connecting the impact rod to the lever, the abutment to which is attached the spring, and the site of the actuating force, the lever is initially pivotable about the bearing until the contact elements of the vacuum-type interrupter contact each other, after which the lever is pivoted about the joint connecting the lever and the impacting rod against the tension of the spring, so that the spring contributes a contact force between the movable and the stationary contact elements and also stores a force suitable for breaking the contact of the contact elements when the external actuating force is sufficiently reduced.

5,069,078

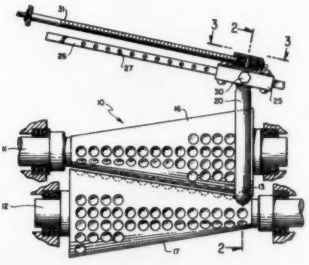
TRANSMISSION MECHANISM

Everitt E. Fairbanks, 3263 S. Clay St., Green Bay, Wis. 54301

Filed Jul. 30, 1990, Ser. No. 559,657

Int. Cl.[5] F16H *3/00*

U.S. Cl. 74—216.3 **1 Claim**



1. A transmission mechanism comprising the combination of:

a housing;

a pair of spaced-apart shafts having parallel turning axes wherein each shaft includes a conical portion tapering in a direction opposite to the conical portion of said other shaft;

a selected one of said shafts being a driving shaft conical portion for forcibly urging the other of said shafts constituting a driven conical portion;

a plurality of hemispherical recesses carried on said pair of conical portions arranged in rows around the circumferences and spaced along the length of each of said conical portions and in spaced-apart columns;

a movable hollow carriage of C-shape configuration having open ends opposing each other in fixed spaced apart relationship separated by the close proximity of said driving and said driven conical portions;

a plurality of spherical intermediate drive members movably retained in said hollow carriage for feeding a selective one of said drive members for transmitting rotative movement between said drive conical portion and said driven conical portion whereby relative velocity of said pair of shafts is controlled by axial movement of said carriage along said conical portions;

said plurality of said drive members are enclosed within said carriage in a linear series so that each drive member transfers a driving force between said conical portions in a serial sequence;

lead screw means operably connected to said carriage for selectively moving said carriage along the length of said conical portions to determine a multiplicity of "gear ratios";

said carriage includes means for feeding said drive members to said recesses in an orderly manner including resilient clips carried at a selected one of said carriage open ends for presenting said selected one of said drive members to said conical portions' recesses which are in opposition facing each other;

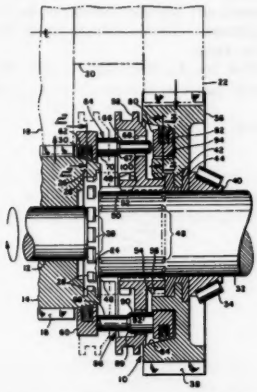
said carriage open end opposite to said open end carrying said clips adapted to receive said selected one of said drive members in response to movement of said drive members through said hollow carriage.

5,069,079

SELF-ENERGIZING SYNCHRONIZER

John R. Vandervoort, Richland, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jul. 2, 1990, Ser. No. 548,354
Int. Cl.[5] F16H *3/38*
U.S. Cl. 74—339 9 Claims



1. In synchronized gear shifting in a power transmission, the improvement comprising:

(a) housing means;

(b) input shaft means journalled for rotation on said housing means and adapted for receiving torque thereon;

(c) output shaft means journalled for rotation on said housing means independently of and about an axis coincident with the axis of rotation of said input shaft means and adapted for transmitting torque therefrom;

(d) clutch means mounted for fixed rotation with and axial movement on one of said input and output shaft means, said clutch means having a first and second set of axially spaced peripheral teeth thereabout, said clutch means adapted for being axially moved by a shifting fork;

(e) output gear means mounted for rotation with said output shaft means, said output gear means having a set of teeth engageable with said second set of clutch means peripheral teeth, said output gear means also having provided thereon an annular tapered friction surface;

(f) said input shaft means having a set of teeth engageable with said first set of clutch means peripheral teeth and having provided thereon an annular tapered friction surface;

(g) said clutch means defining engagement surfaces thereon adapted for engaging a synchronizing ring;

(h) a first annular synchronizing means including means defining friction surfaces complementary to said input shaft means annular tapered surface, said first synchronizing member defining surfaces thereon engaging said clutch means engaging surfaces in a tangential direction and permitting axial sliding movement therebetween, said means defining said friction surfaces including a plurality of circumferentially spaced sprag members pivotally movable to effect frictional synchronizing of said annular member with said input shaft means annular tapered surface upon one of said input shaft means and said synchronizing means overrunning the other, and operable to effect release of frictional synchronizing upon the other overrunning said one, wherein said clutch means is operable upon user movement from a first to a second axial position to effect synchronization and engagement of said clutch means and said input gear means;

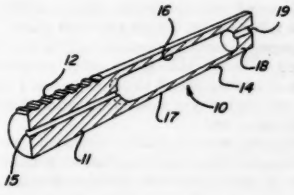
(i) a second annular synchronizing means including means defining friction surfaces complementary to said output gear means annular tapered surface and including a plurality of circumferentially spaced sprag members pivotally movable to effect self-energizing frictional synchronization of said second synchronizing means with said output gear means upon operator axial movement of said second synchronizer means when said output shaft means overruns said output gear means, said sprag members are pivotally moved to release said frictional synchronization when said output gear means overruns said output shaft means.

5,069,080

ELONGATED, LIGHTWEIGHT RACK

Joseph A. Simon, 30855 Little Mack Ave., Roseville, Mich. 48066

Division of Ser. No. 490,286, Mar. 8, 1990, Pat. No. 4,991,421.
This application Dec. 24, 1990, Ser. No. 633,297
Int. Cl.[5] F16H *1/04;* B62D *1/20*
U.S. Cl. 74—422 4 Claims



1. A rack for transmitting forces from a pinion means in an automotive-type, steering gear assembly and the like machinery, comprising;

an elongated, substantially uniform, outer diameter, extruded metal tube forming an elongated rack part and an integral elongated link part with the two parts extending end to end along a common axis;

the rack being substantially solid in cross section, but having a central, longitudinally extending opening extending from its free end to the link portion with the opening having a relatively small diameter with respect to the diameter of the tube;

and the link portion being substantially hollow with a central opening longitudinally extending from and communicating with the rack central opening, said link portion opening having a diameter larger than the rack part opening and with the large diameter central opening in the link part extending substantially the full length of the link part, with the link part having a thin wall cross section for substantially its full length;

whereby the elongated rack is substantially hollow for a considerable portion of its length for providing a substantially reduced weight;

and a series of spaced apart, transversely extending teeth formed in the exterior surface of the rack part, with the series of teeth formed along a substantial portion of the length of the rack part, and with the teeth being shaped for engagement with a corresponding pinion member.

5,069,081

MULTI-MODE SPLINED BALL SCREW ASSEMBLY

Kunihiko Morita, Koganei, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

Filed Jan. 10, 1991, Ser. No. 640,443
Claims priority, application Japan, Jan. 16, 1990, 2-2441[U]
Int. Cl.[5] F16H *29/20, 1/20*
U.S. Cl. 74—424 B 3 Claims

1. A splined ball screw assembly comprising:

a first shaft rotatably supported by a housing and having a spline outer peripheral surface;

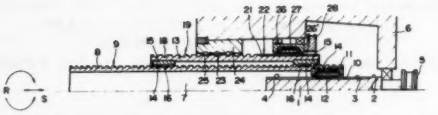
a second hollow shaft having an inner diameter large enough

to allow said first shaft to be fitted therein and a ball screw outer peripheral surface;

first engaging means fixedly attached to said second hollow shaft and engaged with the spline outer peripheral surface of the first shaft to thereby allow a relative axial movement between said first and second shafts;

a third hollow shaft having an inner diameter large enough to allow said second shaft to be fitted therein and a spline outer peripheral surface section and a ball screw outer peripheral surface section;

second engaging means fixedly attached to said third shaft and engaged with the ball screw outer peripheral surface



of said second shaft to thereby allow a relative rotational motion between said second and third shafts;

third engaging means fixedly supported by said housing and engaged with the ball spline outer peripheral surface section of said third shaft to thereby allow a relative rotational motion between said third shaft and said third engaging means; and

fourth engaging means rotatably supported by said housing and engaged with the spline outer peripheral surface section of said third shaft to thereby allow a relative axial motion between said third shaft and said fourth engaging means.

5,069,082

CONTROLLER FOR POWERED INDUSTRIAL TRUCKS

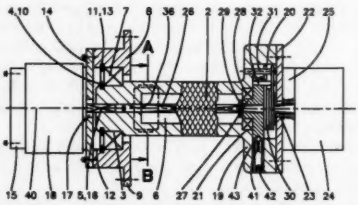
Gert Seng, and Gerard Vesin, both of Reutlingen, Fed. Rep. of Germany, assignors to Wagner Foerdertechnik GmbH & Co. Kg, Fed. Rep. of Germany

Filed May 7, 1990, Ser. No. 520,105

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1989, 3925872

Int. Cl.[5] G05G *1/04*

U.S. Cl. 74—523 **9 Claims**



1. A one hand controller for independently controlling a first and second function, the controller comprising:

a support;

a handle rotatably mounted on a first end to said support and freely suspended on an opposite second end;

a first function potentiometer continuously measuring rotation of said handle and controlling the first function dependent upon said measured rotation;

signal emitter means slidably mounted on a circumference of said handle and rotatably adjustable independent of said rotation of said handle;

a second function potentiometer continuously measuring movement of said signal emitter means and controlling the second function dependent on said measured movement;

a first function spring means mounted between said handle and said support for returning said handle to a predetermined position upon removal of torque to said handle; and

a second function spring means mounted between said handle and said signal emitter means for returning said signal emitter means to a predetermined position upon removal of torque to said signal emitter means.

5,069,083

CONTINUOUS SPEED VARIABLE TRANSMISSION CONTROL APPARATUS

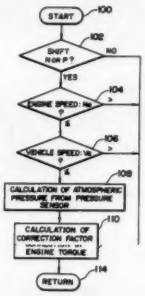
Sadayuki Hirano; Yoshinori Yamashita, both of Shizuoka; Takumi Tatsumi, and Hiroaki Yamamoto, both of Hyogo, all of Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Sep. 26, 1990, Ser. No. 588,762

Claims priority, application Japan, Sep. 30, 1989, 1-256340

Int. Cl.[5] B60K *41/16*

U.S. Cl. 74—844 **3 Claims**



1. In a continuous speed variable transmission control apparatus for controlling a continuous variable speed transmission having a belt looped around adjustable pulleys and received in respective grooves of said pulleys defined between relatively movable pulley elements, and means for changing the belt ratio including means for increasing and decreasing the belt turning radius by respectively decreasing and increasing the width of said grooves, the improvement comprising an absolute pressure detection type pressure sensor for detecting atmospheric pressure, and a control means for detecting atmospheric pressure through said pressure sensor in accordance with the shift position of the transmission and other predetermined conditions and for correcting clutch pressure and line pressure to proper levels based on said detected atmospheric pressure.

5,069,084

CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION IN AN AUTOMOTIVE VEHICLE

Yuji Matsuno; Yoshinobu Kido, and Yoshiharu Sugiyama, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 1, 1991, Ser. No. 662,577

Claims priority, application Japan, Mar. 5, 1990, 2-53119

Int. Cl.[5] F16H *61/10*

U.S. Cl. 74—844 **5 Claims**

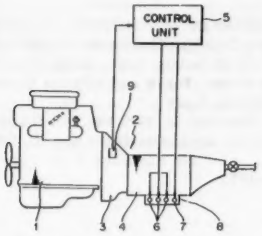
1. A control system for an automatic transmission in an automotive vehicle, which selects an appropriate shift pattern in compliance with a temperature of hydraulic oil contained in a torque converter of the automatic transmission, said control system comprising:

a transmission control unit having a plurality of shift patterns including a first shift pattern favored for a cold engine and a second shift pattern favored for an engine after warm-up;

oil temperature detector means for detecting the temperature of hydraulic oil contained in or supplied to the torque converter;

timer means for counting a time period after engine starting; and

shift pattern selector means for selecting said first shift pattern when the temperature of hydraulic oil is less than a preset value, said shift pattern selector means selecting said second shift pattern when the time set by said timer means is up.



5,069,085

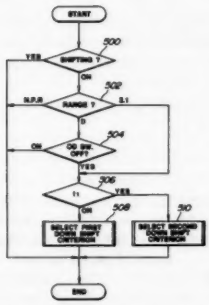
SHIFT CONTROL SYSTEM FOR AUTOMATIC POWER TRANSMISSION WITH ENHANCED SHIFTING TRANSITION CHARACTERISTICS

Naonori Iizuka, Shizuoka, Japan, assignor to Jatco Corporation, Shizuoka, Japan

Filed Feb. 15, 1990, Ser. No. 480,717

Int. Cl.[5] F16H *59/44, 59, 24*

U.S. Cl. 74—866 **5 Claims**



1. A shift control system for an automatic power transmission for an automotive vehicle, the automatic transmission being shiftable between a plurality of speed ratios and having a plurality of operational ranges, comprising:

manually operable first means for generating a down-shift command indicative signal;

second means for detecting a vehicle speed representative data of the vehicle and generating a vehicle speed;

third means for comparing a selected one of first and second down-shifting criteria with said vehicle speed indicative signal and determining an optimum shift timing after said down-shift command indicative signal has been generated, said first down-shifting criterion being set at a value corresponding to a higher vehicle speed than that of said second down-shifting criterion, said third means being operative to keep selecting said first down-shifting criterion for a predetermined period of time after said down-shift command indicative signal has been generated and subsequently selecting said second down-shifting criterion after expiration of said predetermined time period.

5,069,086

BELT RATIO CONTROLLER FOR A CONTINUOUSLY VAIABLE TRANSMISSION

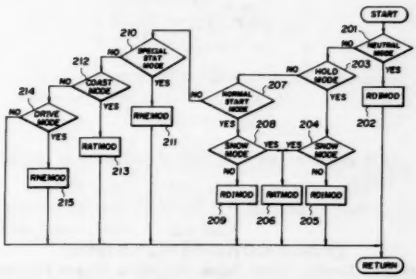
Katsuaki Murano; Yoshinori Yamashita; Sadayuki Hirano, all of Shizuoka; Takumi Tatsumi, and Hiroaki Yamamoto, both of Hyogo, all of Japan, assignors to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka and Mitsubishi Denki Kabushiki Kaisha, Tokyo, both of, Japan

Filed Nov. 29, 1989, Ser. No. 443,707

Claims priority, application Japan, Nov. 30, 1988, 63-302731

Int. Cl.[5] B60K *41/14*

U.S. Cl. 74—866 **10 Claims**



1. A belt ratio controller for a continuously variable transmission, comprising means for controlling a speed change by increasing and decreasing the width of a groove between a fixed pulley part and a movable pulley part of the transmission by varying an oil pressure to increase and decrease the rotating radius of a belt wound on the pulley parts and thereby change a belt ratio, surface condition indicating means for generating a signal indicating whether the vehicle is on a slippery surface, and control means responsive to said signal indicating the vehicle is on a slippery surface for controlling the belt ratio toward a target belt ratio value set based on the opening of a throttle at the time of starting vehicle movement.

5,069,087

CLUTCH CHANGEOVER CIRCUIT FOR NON-STAGE TRANSMISSION

Tsutomu Ishino, Yawati, and Ryoichi Maruyama, Hirakata, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Japan

PCT No. PCT/JP89/00141, § 371 Date Jul. 20, 1989, § 102(e) Date Jul. 20, 1989, PCT Pub. No. WO89/07723, PCT Pub. Date Aug. 24, 1989

PCT Filed Feb. 13, 1989, Ser. No. 392,537

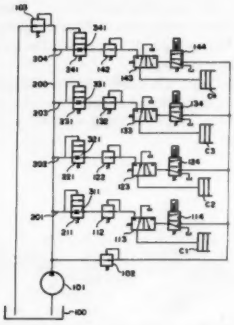
Claims priority, application Japan, Feb. 19, 1988, 63-37051; Feb. 19, 1988, 63-37052

Int. Cl.[5] B60K *41/06*

U.S. Cl. 74—867 **6 Claims**

1. A clutch changeover circuit for a multi-stage type stationary mechanical non-stage transmission, in which at least pressure regulating valves are provided in oil passages leading from a pump to respective clutches, said clutch changeover circuit comprising:

throttle passages each provided at the valve-closing position of each of said pressure regulating valves in such a manner



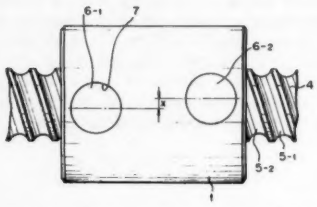
as to communicate with each of said pressure regulating valves.

5,069,088

LINEAR MOTION BALL BEARING

Kazuhiko Tanaka, Fuchu, Japan, assignor to Nippon Thompson, Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1990, Ser. No. 478,561
Claims priority, application Japan, Oct. 13, 1989, 1-119250[U]
Int. Cl.[5] F16H *49/00*
U.S. Cl. 74—89.15 **2 Claims**



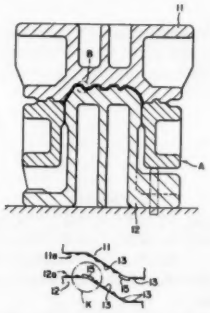
2. A bearing for effecting endless linear motion comprising:
an insert member;
an outer sleeve member;
a plurality of balls adapted to be carried between said insert member and said outer sleeve member,
said insert member having on its peripheral surface a first double thread screw track for carrying said balls, said first track comprising a first spiral groove and a second spiral groove adjacent said first spiral groove, said first spiral groove having a shallower depth than said second spiral groove;
said outer sleeve member having on its inner surface a second double thread screw track for carrying said balls, said second track comprising two spiral grooves;
said two spiral grooves in said outer sleeve member being adapted to mate with said first spiral groove and said second spiral groove in said insert member and to hold said balls therebetween; and
two longitudinally spaced-apart plugs extending to the inner surface of said outer sleeve member for changing the path of said plurality of balls between said first spiral groove and said second spiral groove, the center of one of said plugs being displaced a predetermined distance from a line parallel to the longitudinal axis of said outer sleeve member extending through the center of the other of said plugs, the predetermined distance being substantially less than one half the outer sleeve member circumference;
whereby said balls are load bearing when carried in said first spiral groove and are non-load bearing when carried in said second spiral groove.

5,069,089

METHOD OF MACHINING A PRESS DIE

Toshio Yasuno; Toshihiro Thukagoshi; Shinji Hoshii, and Yasuo Imaizumi, all of Gunma, Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo and Teikoku Kuromu Co., Ltd., Nagoya, both of, Japan

Filed Sep. 20, 1990, Ser. No. 585,668
Claims priority, application Japan, Sep. 22, 1989, 1-244974
Int. Cl.[5] B21K *5/20*
U.S. Cl. 76—107.1 **9 Claims**



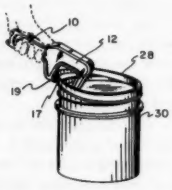
1. A method of machining a press die, comprising the steps of:
forming a scabrous surface by cutting a die block of the press die;
grinding part of the scabrous surface of the die block to form a smooth surface, the part being adapted to make a contact with a work from an initial stage of press working of the work by the press die; and
coating a friction resistant material layer over the smooth surface.

5,069,090

MULTI-PURPOSE CONTAINER OPENING TOOL

Ronald M. Clark, 105 Factory, Addison, Ill. 60101

Filed Feb. 26, 1990, Ser. No. 486,355
Int. Cl.[5] B67B *7/44*
U.S. Cl. 81—3.09 **3 Claims**



1. A tool for removing lids from containers, said tool comprising
a handle portion;
a claw opener portion extending from a first end of said handle portion;
said handle and claw opener portions being of a selected first thickness and having a reinforcing ridge disposed about the periphery thereof; and
said claw opener having a flange adapted to engage the lid of a container and being provided at its lower surface with a

transverse shoulder operative to prevent said flange from engaging said container.

5,069,091

SCREWDRIVER WITH PIVOTAL HANDLE

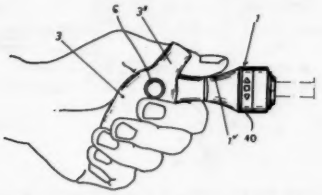
Holger Bramsiepe, Essen, and Matthias Ocklenburg, Wuppertal, both of Fed. Rep. of Germany, assignors to Firma Robert Schroder, Wuppertal, Fed. Rep. of Germany

Filed Jul. 13, 1990, Ser. No. 553,782

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1989, 8910673[U]

Int. Cl.[5] B25G *1/00*

U.S. Cl. 81—177.7 **8 Claims**



1. A handle for a screwdriver-type tool rotatable about an axis, the handle comprising:

a front handle portion having a front end adapted to carry the tool and a rear end formed with a pivot centered on an axis transverse to the tool axis and spaced by a predetermined axial distance from the front-portion front end; and

a rear portion mounted on the pivot on the front handle portion and displaceable between a normal-use position generally centered on and extending along the tool axis and a high-torque position extending transverse to the tool axis, the portions having a combined axial length in the normal-use position equal to less than twice the overall axial length of the front handle portion, the rear portion having

a front part projecting in the normal-use position axially forward a predetermined distance past the transverse axis and formed by a pair of legs flanking the rear end of the front handle portion, the legs projecting in the high-torque position laterally past the front portion and forming in the high-torque position a laterally open seat, and

an overall axial length equal to about three times the predetermined distance the front part projects past the transverse axis; and

a pivot pin extending along the traverse axis through the rear end of the front handle portion and the rear portion, whereby when in the high-torque position the fingers of the user engage around the rear portion and the thumb of the user lies in the seat, between the legs of the front part, and against the front portion.

5,069,092

CUTTING TOOL FOR ALUMINUM WORKPIECES HAVING ENHANCED CRATER WEAR RESISTANCE

Duane J. Schmatz, Dearborn Heights; John S. Badgley, Dearborn, and Charles O. McHugh, Dearborn Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

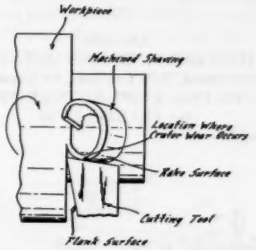
Division of Ser. No. 133,826, Dec. 18, 1987. This application Jul. 15, 1988, Ser. No. 220,124

Int. Cl.[5] B23B *13/00*

U.S. Cl. 82—1.11 **1 Claim**

1. A method of machining aluminum-based workpieces at high surface speed exceeding 1000 sfm, comprising:

moving an iron-based cutting tool against said aluminum-based workpiece to continuously shear off a shaving of said workpiece, said tool having a heat treated substrate, said cutting tool having a rake face contacted by said shaving, which face is coated with a single-phase crystal



film of sputtered silicon carbide without disrupting the heat treat of the substrate.

5,069,093

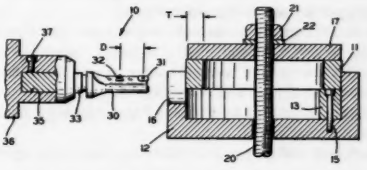
METHOD AND APPARATUS FOR FORMING AN INCOMPLETE HOLE IN A WORKPIECE

Charles W. Carswell, Marshall, N.C., assignor to Dana Corporation, Toledo, Ohio

Filed Nov. 30, 1988, Ser. No. 277,800

Int. Cl.[5] B23B *1/00*

U.S. Cl. 82—1.11 **2 Claims**



1. A method for forming an incomplete hole in a workpiece having a finished dimension comprising the steps of:

(a) providing a region in the workpiece adjacent to an edge thereof with a predetermined thickness;

(b) providing a tool defining an axis of rotation;

(c) attaching a first cutting means at a location on the tool such that a cutting edge thereof is located a first predetermined distance from the rotational axis of the tool;

(d) attaching a second cutting means at a location on the tool such that a cutting edge thereof is located a second predetermined distance from the rotational axis of the tool, the second predetermined distance being greater than the first predetermined distance, said attachment location of the second cutting means being spaced apart from said attachment location of the first cutting means by an axial distance along the tool which is greater than the predetermined thickness of the region of the workpiece;

(e) rotating the tool about the axis such that the first and second cutting means are moved in circular paths relative to the workpiece;

(f) orienting the tool on a projected linear path which will provide for the circular paths of movement of the first and second cutting means to overlap the edge of the workpiece when said tool passes along said linear path;

(g) providing a hollow movable support having a recess formed therethrough adjacent to one end thereof;

(h) supporting the workpiece within the support such the region of the workpiece where the incomplete hole is to be formed is exposed to the tool through the recess; and

(i) moving the tool relative to the workpiece along said linear path and into engagement with the workpiece so that the first and second cutting means pass through the workpiece to form the incomplete hole, the first cutting means passing completely through the workpiece to form

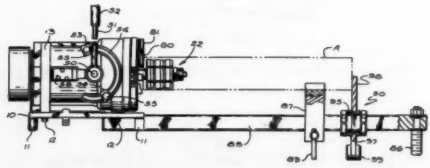
an incomplete hole having a rough dimension before the second cutting means passes through the workpiece to form the incomplete hole having a finished dimension.

5,069,094

TUBE END FINISHING MACHINE

Orville J. Birkestrand, 2705 Lee Ave., El Monte, Calif. 91773

Filed Sep. 8, 1987, Ser. No. 93,591
Int. Cl.[5] B25B *13/06*
U.S. Cl. 82—121 13 Claims



1. A tube finishing machine comprising

a housing having coaxially mounted thereon a collet assembly spaced from said housing and expansible to grip the interior of a tubular workpiece,

means rotatable on said common axis and axially movable within the space between said housing and said collet assembly for performing machining operations on a tube gripped by said collet assembly and

a common control means including a single operation initiating device for sequentially initiating expansion of said collet assembly to cause the same to grip the interior of a tube placed over said assembly;

axial movement of said means for performing machining operations; and

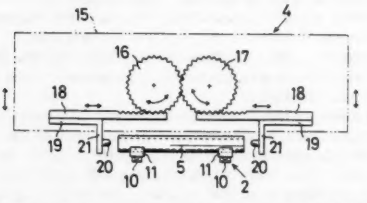
rotation of said means for performing machining operations.

5,069,095

PIPE CENTERING APPARATUS

Noboru Ohneda, Oyamashi; Shunta Ushioda, Yukishi; Haruo Arima; Ichiro Hashimoto, both of Oyamashi; Denziro Kaneko, Tochigishi; Kazuo Sugiyama, Shimodateshi; Tsuguo Fukazawa, Oyamashi; Teruo Tachi, Kasamashi, and Takashi Mukasa, Yukishi, all of Japan, assignors to Showa Aluminum Kabushiki Kaisha, Osaka, Japan

Filed Nov. 21, 1990, Ser. No. 616,378
Claims priority, application Japan, Nov. 30, 1989, 1-312362
Int. Cl.[5] B23B *15/00;* B65G *47/24*
U.S. Cl. 82—124 4 Claims



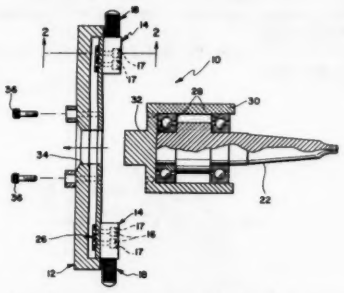
1. A pipe centering apparatus comprising: a pair of right and left gears in mesh with each other and rotatably mounted to a main frame, one of the gears being a drive gear; a pair of right and left racks respectively in mesh with the right and left gears so as to reciprocate in axial direction of pipes; and a pair of right and left regulators respectively secured to the right an left racks so as to come into contact with ends of the pipes to thereby center the pipes when the right and left racks are driven towards each other.

5,069,096

ADVANCED SPIDER FIXTURE

Michael R. Desrosiers, Westport, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 1, 1990, Ser. No. 591,210
Int. Cl.[5] B23B *23/04, 33/00*
U.S. Cl. 82—151 5 Claims



1. A spider for providing a rotatable interface comprising:

a circular base plate having a plurality of spaced radially disposed undercut grooves near the outer circumference thereof and an aperture at its axis;

a plurality of first and second clamping pieces with respective members of said first and second clamping pieces clamped to said base plate at said undercut radial grooves, said first and second clamping pieces being adjustable in the radial direction with respect to said base plate;

a plurality of holding screws, one each of said screws being affixed to one of said first clamping pieces, each of said screws having adjustable means for extending further outward in a radial direction than said first clamping piece to which it is affixed and than said base plate;

a housing having a cylindrical boss for being secured with said base plate at said aperture of said base plate; and

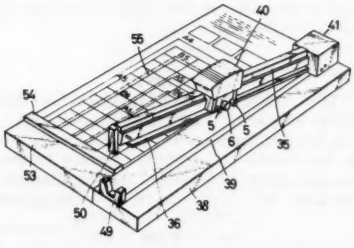
a tail piece rotatably connected to said housing.

5,069,097

PAPER-CUTTING MACHINE AND METHOD OF CUTTING PAPER

Chuzo Mori, Katsushika, Japan, assignor to Carl Manufacturing Co., Ltd., Katsushika, Japan

Filed Feb. 9, 1989, Ser. No. 307,966
Claims priority, application Japan, Feb. 29, 1988, 63-26776[U]
Int. Cl.[5] B26D *1/18*
U.S. Cl. 83—56 3 Claims



1. A method of cutting paper comprising the steps of:

holding paper by means of a paper holder which is resiliently provided on a rail which is pivotally supported at one end thereof by a rail support provided on one end of a board so that an opposite end of said rail is movable up and down, subjecting two guide pins of said rail support to a

biasing force using springs so as to resiliently support two side surfaces, respectively, of said rail when moved downward;

locating said paper holder between said rail and said board by mounting said paper holder on an underside of said rail;

securing said rail holding the paper by means of a hook provided at the opposite end of said rail; and

cutting said paper with a cutter blade rotatably provided on a slider which is slidable along said rail and which is resiliently movable up and down by sliding said slider.

5,069,098

LIMIT SWITCH FOR THE SELECTIVE POSITIONING OF CUTTING UNITS IN AN APPARATUS FOR THE CUTTING OF PLASTIC AND/OR PAPER MATERIALS

Elio Cavagna, Melegnano, Italy, assignor to Elio Cavagna S.r.l., Milan, Italy

Filed Jul. 24, 1990, Ser. No. 557,554
Claims priority, application Italy, Aug. 1, 1989, 21400 A/89
Int. Cl.[5] B26D *1/24, 5/02*
U.S. Cl. 83—62.1 **7 Claims**

1. In a machine for cutting plastic and paper materials into strips of predetermined width, which includes a frame (**26**), a plurality of cutting units (**12**), said frame having opposite ends, each of said cutting units including an upper blade (**14**) and a lower counterblade (**16**), said machine comprising an upper element (**18**) and a lower base (**20**) for supporting said blade and said counterblade respectively, said cutting units sliding by motor means on an upper beam (**22**) and a lower beam (**24**), said upper and said lower beam being supported by said frame, said motor means being driven by an electronic station, a limit switch for selective positioning each of said cutting units, which comprises: a source of a ray of light (**31**) fixed to said frame (**26**) in the proximity of said lower beam (**24**), said source of a ray of light (**31**) emitting a ray of light (**50**) which is parallel to said lower beam (**24**); a light receiver (**33**) of said ray of light fixed to said frame, said source of a ray of light (**31**) and said light receiver being fixed at said opposite ends of said frame, a rotating means (**36**) hinged (**40**) to one side of said lower base (**20**) of each cutting unit (**12**) and maintained in parallel position to said ray of light (**50**) by elastic means (**42**) when in an inoperative position; actuating means (**38**) fixed to the other side of the lower base of each cutting unit (**12**), in position opposite that at which the rotating means (**36**) is hinged and in alignment with said rotating means; each of said actuating means of each cutting unit acting on the rotating means of the immediately adjacent cutting unit to pivot said rotating means from said inoperative position to a pivoting position wherein said rotating means intercepts the ray of light (**50**), whereby said electronic station changes the direction of motion of each of said cutting units.

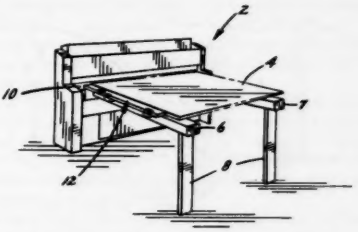
5,069,099

SHEAR WITH STORABLE SQUARING ARM

Wayne L. Fulton, Rockford, Ill., assignor to W. A. Whitney Corp., Rockford, Ill.

Filed Jan. 28, 1991, Ser. No. 646,242
Int. Cl.[5] B26D *7/01*
U.S. Cl. 83—468.6 **5 Claims**

4. The combination of, a shear for cutting a workpiece, a stand having an elongated rail for supporting the workpiece during cutting and extending rearwardly from said shear, and a squaring arm for locating the workpiece in a predetermined orientation relative to said shear, said squaring arm having forward and rear sections each having front and rear end portions, means mounting said rear section on said rail for pivoting about an axis extending longitudinally of the rail between an active position in which the rear section is located above the rail and a stored position in which the rear section is located below the rail, means connecting the rear end portion of said forward section to the front end portion of said rear section and supporting said forward section to pivot between



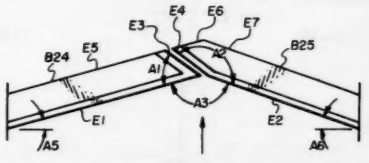
active and inactive positions about an axis extending transversely of said rail, said forward section extending forwardly from and lying in substantially the same plane as said rear section when said forward section is in said active position, said forward section being folded on top of said rear section when said forward section is in its inactive position, and means for releasably securing the front end portion of said forward section to said shear when said forward section is in its active position.

5,069,100

FIBER-FREE KNIFE FOR HYDRAULIC VEGETABLE CUTTING SYSTEM

Clifford Jackson, P.O. Box 646, Burley, Id. 83318

Filed Jul. 17, 1990, Ser. No. 553,964
Int. Cl.[5] B26D *1/03, 7/20*
U.S. Cl. 83—857 **12 Claims**



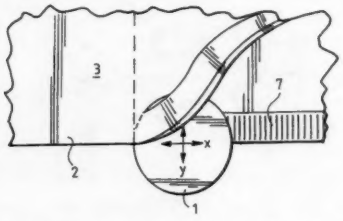
1. A stationary cutting device for use in a hydraulic cutting machine for cutting vegetables comprising: a peripheral blade support structure having an open central area and a circumscribing member, said support structure having cantilevered blades having a sharpened edge attached thereto which project into the open central area, arranged in pairs of blades with each blade of a pair of blades aligned and opposite to the other blade of said pair, each blade attached at its proximal end to said support structure and having a distal end which extends to at least about the geometric center of said cutting device, the edge of each blade being sharpened so that the cutting edge of each blade faces the opening of said support structure, the distal tip of each blade cutting edge slightly overlapping the distal knife tip of an opposed, aligned blade.

5,069,101

DEVICE FOR REDUCING THE THICKNESS OF THE EDGE OF A BOARD WEB OR BOARD SHEETS

Pertti Kleemola, Valkeakoski, Finland, assignor to Yhtyneet Paperitehtaat Oy Walki-Pakkaus, Valkeakoski, Finland

Filed Oct. 16, 1990, Ser. No. 597,010
Claims priority, application Finland, Oct. 17, 1989, 4921/89
Int. Cl.[5] B26D *3/06*
U.S. Cl. 83—869 **2 Claims**



1. A device for reducing the thickness of an edge (2) of a board web (3) or board sheets, comprising

a cutting blade (1);

means (6) for supporting, positioning and rotating the cutting blade; and

means for guiding the edge (2) to be thinned with respect to the cutting blade (1);

characterized in that

the cutting blade (1) is disclike; and

the edge guiding means comprise a lower roll (4) and means (5) for tightening the edge to be thinned against the lower roll;

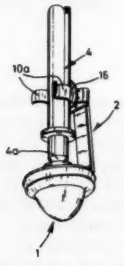
the means for positioning the cutting blade comprising means for displacing the cutting blade (1) in a first direction parallel to the edge to be thinned, in a second direction perpendicular to the edge to be thinned, and in a third direction perpendicular to both the first direction and the second direction and for tilting the blade around a line parallel with the direction (x) of the edge (2) to be thinned.

5,069,102

FLOOR PROTECTING ATTACHMENT FOR THE LEGS OF BOWED STRINGED MUSICAL INSTRUMENTS

Wilhelm Wolf, Hof ter Weydeweg 1, NL-3451 St Vleuten, Netherlands

Filed Dec. 14, 1989, Ser. No. 451,117
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1989, 8901094[U]; Oct. 21, 1989, 3935160
Int. Cl.[5] G10D *1/02*
U.S. Cl. 84—280 **17 Claims**



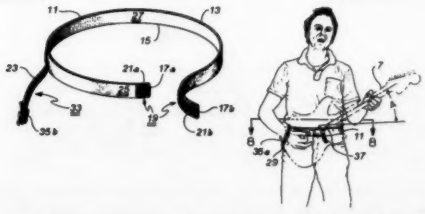
1. Floor protecting attachment for a leg of a bowed stringed musical instrument, comprising a substantially conical elastic floor contacting element; and means for separably coupling the floor contacting element to the leg of the instrument, said coupling means comprising a carrier member which is separably secured to the leg of the instrument and a supporting member connecting said floor contacting element to said carrier member, said supporting member having a first side confronting said carrier member and a second side and said supporting member comprising annular bearing means for the floor contacting element at the second side of said supporting member, said floor contacting element including a substantially circular base which is adjacent the second side of said supporting member and has a first diameter, said bearing means surrounding said floor contacting element in the region of said base and having a second diameter smaller than said first diameter.

5,069,103

STRINGED INSTRUMENT SUPPORT DEVICE

Brian C. Healy, 2212 Carol View Dr., #C301, Cardiff by the Sea, Calif. 92007

Filed Sep. 10, 1990, Ser. No. 580,170
Int. Cl.[5] G10D *3/00*; **G10G** *5/00*
U.S. Cl. 84—327 **19 Claims**



1. A device for removably supporting a stringed instrument in playing position of the type comprising a large sound box with strings mounted thereover that extend along a narrow neck, comprising:

a) a wide, waist-encircling belt defined by spaced-apart upper and lower edges, terminated by spaced-apart ends and including means for attaching said belt about one's waist in overlap fashion;

b) a first short length of flexible strap attached at one end to said belt;

c) a second short length of flexible strap attached at one end to said instrument, spaced-apart from said neck;

d) means for temporarily interconnecting said first and said second straps to provide support for a portion of the weight of the instrument while providing room to lift the instrument away from said belt; and,

e) a shaped bracket including:

i) a shank portion including means for mounting on a back surface of the sound box spaced-apart from said point of attachment of said second strap;

ii) a wide, downwardly angling hook portion, forming a top edge that is fixed at an acute angle with the neck of the instrument, for hooking over said belt to temporarily support the balance of the weight of the stringed instrument and retain it in playing position; and,

iii) a transition portion interconnecting said shank portion and said hook portion, curving away from said base portion to enable said hook portion to retain the stringed instrument close against the performer's body.

5,069,104

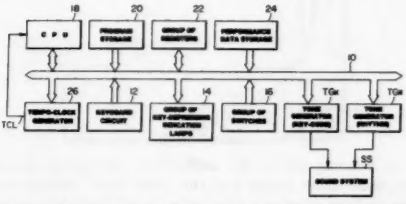
AUTOMATIC KEY-DEPRESSION INDICATION APPARATUS

Takeo Shibukawa, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Jan. 17, 1990, Ser. No. 466,876
Claims priority, application Japan, Jan. 19, 1989, 1-10336
Int. Cl.[5] G10H *7/00*
U.S. Cl. 84—478 **7 Claims**

1. An automatic key-depression indication apparatus comprising:

(a) a keyboard having a plurality of keys;
(b) a plurality of key-depression indication elements corresponding to each of the keys;
(c) key-depression detection means for detecting a depressed key and for generating key-depression information corresponding to the depressed key;
(d) key-depression indication control means for controlling the indication elements to cause them to indicate keys which should be depressed based on previously stored pieces of musical note information respectively corresponding to the keys;
(e) selection means for selecting at least one piece of information from among the pieces of musical note information, the selected musical note information being less than the total of the musical note information;



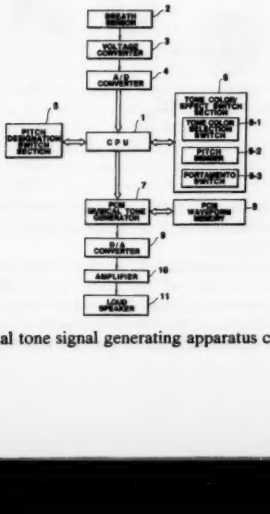
(f) examination means for examining whether correspondence exists between the selected musical note information and the key-depression information; and
(g) advance control means connected to the key-depression indication control means and the examination means, for causing the key-depression indication control means to continue progression of an indication operation when the examination means determines that a correspondence exists between the selected musical note information and the key-depression information, and for causing the key-depression indication control means to stop the indication operation when the examination means determines that there is no correspondence between the selected musical note information and the key-depression information.

5,069,105

MUSICAL TONE SIGNAL GENERATING APPARATUS WITH SMOOTH TONE COLOR CHANGE IN RESPONSE TO PITCH CHANGE COMMAND

Akio Iba, Tokorozawa, and Kenichi Tsutsumi, Tokyo, both of Japan, assignors to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jan. 29, 1990, Ser. No. 471,835
Claims priority, application Japan, Feb. 3, 1989, 1-24025; Feb. 15, 1989, 1-33535; May 15, 1989, 1-120750
Int. Cl.[5] G10H *7/00*
U.S. Cl. 84—605 **18 Claims**



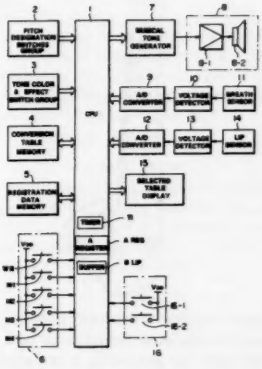
1. A musical tone signal generating apparatus comprising:
memory means for storing different waveform data in correspondence with a plurality of different tone ranges;
pitch designation means for designating a pitch of a musical tone;
waveform designation means for designating, from said memory means, waveform data corresponding to a tone range to which the pitch designated by said pitch designation means belongs;
readout means for reading out the waveform data designated by said waveform designation means at a frequency corresponding to the pitch designated by said pitch designation means;
musical tone signal output means for generating a musical tone signal on the basis of the waveform data read out by said readout means;
timing signal generation means, operative when a current pitch of a musical tone signal in generation is changed by said pitch designation means to a new pitch belonging to a new tone range different front a current tone range to which the current pitch belongs, for generating a switching timing signal; and
switching means for causing said readout means to read out waveform data corresponding to the new tone range to which the new pitch designated by said pitch designation means belongs in response to the switching timing signal generated by said timing signal generation means.

5,069,106

ELECTRONIC MUSICAL INSTRUMENT WITH MUSICAL TONE PARAMETER SWITCHING FUNCTION

Shigeo Sakashita, Hamura, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jun. 12, 1989, Ser. No. 365,090
Claims priority, application Japan, Jun. 17, 1988, 63-80182[U]
Int. Cl.[5] G10H *1/02*
U.S. Cl. 84—626 **33 Claims**



1. An electronic musical instrument comprising:
musical tone generation instructing means for detecting a breath operation state at a mouthpiece portion arranged on an instrument main body, and for instructing generation of a musical tone in response to detection of a breath operation;
detection means for detecting a biting strength at said mouthpiece portion;
control information output means for outputting a plurality of parameter control information items which are used for variably controlling the contents of at least one parameter of the musical tone to be generated, so that the contents differ from one another in response to the biting strength detected by said detection means, as instructed by said musical tone generation instructing means;
designation means for designating any one of the plurality of

parameter control information items to be output from said control information output means; and

control means, upon detection of the biting strength at said mouthpiece portion by said detection means while said one designated parameter control information item is designated by said designation means, for outputting said one designated parameter control information item in response to detection of the biting strength, and for variably controlling a parameter of the musical tone generated by said musical tone generation instruction means in accordance with the parameter control information item.

5,069,107

ELECTRONIC MUSICAL INSTRUMENT IN WHICH A MUSICAL TONE IS CONTROLLED IN ACCORDANCE WITH A DIGITAL SIGNAL

Shigeo Sakashita, Hamura, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

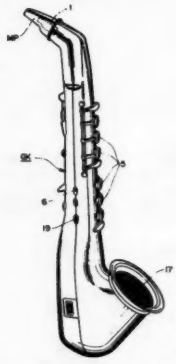
Division of Ser. No. 256,770, Oct. 11, 1988, Pat. No. 4,915,008. This application Feb. 6, 1990, Ser. No. 474,993

Claims priority, application Japan, Oct. 14, 1987, 62-259294; Dec. 31, 1987, 62-200109[U]

The portion of the term of this patent subsequent to Apr. 10, 2007, has been disclaimed.

Int. Cl.[5] G10H *1/06, 1/46*

U.S. Cl. 84—659 **18 Claims**



1. An electronic musical instrument, comprising

air flow sensor means for detecting an air flow state induced by a player and for producing a corresponding analog detection signal;

analog-to-conversion means for converting the analog detection signal detected by said air flow sensor means to a corresponding digital detection signal;

control data generating means for detecting when a first value of the digital detection signal from said analog-to-digital conversion means is at a preset value and for, at a predetermined time after said digital detection signal becomes said preset value, generating tone parameter control data corresponding to a second value of said digital detection signal converted by said analog-to-digital conversion means at said predetermined time; and

tone generation control means coupled to said control data generating means for controlling a tone characteristic of the musical tone to be generated according to said tone parameter control data.

5,069,108

BLASTING DEVICE FOR UNBLOCKING MINE RAISES

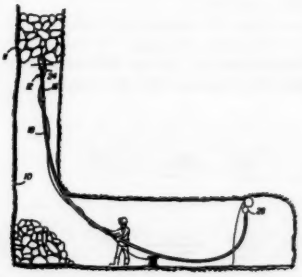
Serge Dion, 856 Boul D'Alembert, D'Alembert, Quebec,, Canada J9X 5A3

Filed Mar. 11, 1991, Ser. No. 668,268

Claims priority, application Canada, Jul. 7, 1990, 2018540

Int. Cl.[5] F42D *3/04;* **F42B** *3/00*

U.S. Cl. 86—20.15 **3 Claims**



1. A blasting device for unblocking ore passes, backfill raises, mine draw points and any other near vertical raises where rocks or other materials normally fall freely but may get blocked during use, comprising:

a) a propulsion unit including an air chamber mounted at the end of a hollow tube and having an inlet for receiving pressurized air and at least one outlet for allowing compressed air jets to exit downwardly from said air chamber to propel the propulsion unit upwardly;

b) a reservoir mounted on said propulsion unit and adapted to hold explosive and an igniter;

c) means for feeding pressurized air into said air chamber through said hollow tube; and

d) an ignition line connected to said igniter for igniting said explosive from a distance.

5,069,109

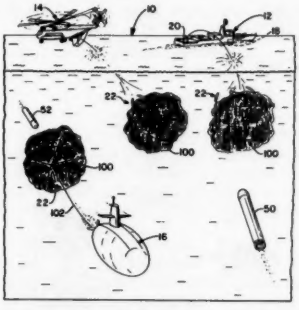
TORPEDO COUNTERMEASURES

Charles K. Lavan, Jr., Medina, Ohio, assignor to Loral Corporation, New York, N.Y.

Filed Nov. 8, 1990, Ser. No. 610,669

Int. Cl.[5] B63G *9/00*

U.S. Cl. 89—1.11 **14 Claims**



10. An autonomous countermeasures device for deployment into an ocean environment to defeat an active torpedo comprises in combination:

a net structure comprised of flat ribbon materials in a square-woven warp and weft geometric pattern and at uniform spacings between parallel adjacent ribbons with stitched interconnections, the ribbons comprising yarns of SPECTRA in combination with yarns taken from the group

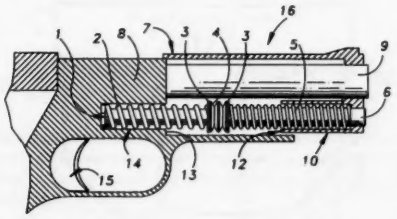
comprising nylon, polyester, aramid, and KEVLAR and having widths within the range of 0.25–1.5 inches (6.35–38.1 mm) and the spacings between adjacent ribbons being within the range of 4–12 inches (10.16–30.48 cm), said net structure having a deployed diameter of at least 10 feet (3.105 m) and a packing density of not more than 45 lbs/ft^3 (730 kgms/m^3).

5,069,110

IMPACT BUFFERING RECOIL MECHANISM

Thomas W. Menck, 5703 S. 77 St., Ralston, Nebr. 68127

Filed Apr. 9, 1991, Ser. No. 682,632
Int. Cl.^{5} F41A *3/80*
U.S. Cl. 89—198 **14 Claims**



13. An impact buffering recoil mechanism for firearms, for dissipating the recoil of a slide member slidably mounted on a firearm frame upon firing of the firearm, comprising:

an elongated member having forward and rearward ends;

first biasing means operably mounted on said guide member, and operable between a compressed, fully biased position, and an unbiased position, said biasing means having rearward and forward ends;

means on the rearward end of said guide member for preventing rearward movement of the rearward end of said first biasing means, whereby said first biasing means may be biased against said stop means;

second biasing means operably mounted on said guide member, having forward and rearward ends and operable between biased and unbiased positions, said second biasing means positioned forwardly of said first biasing means in contact with the forward end of the first biasing means; and

third biasing means operably mounted on said guide member forwardly of said biasing means, having forward and rearward ends and operable between biased and unbiased conditions; the rearward end of said third biasing means in contact with the forward end of said second biasing means so as to bias there against;

said second biasing means operably mounted on said guide member for longitudinal movement there along between said first and third biasing means.

5,069,111

HYDRAULIC PRESSURE-CONTROL DEVICE WITH PARALLEL COMPRESSION SPRINGS

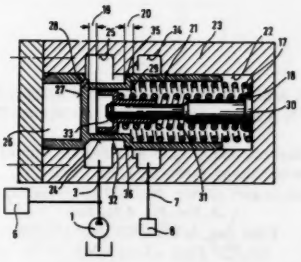
Alfons Löffler, Friedrichshafen, Fed. Rep. of Germany; Walter Marte, Oberteuringen, Austria, and Peter Wiggermann, Oberdorf, Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen AG, Fed. Rep. of Germany

PCT No. PCT/EP88/00254, § 371 Date Oct. 3, 1989, § 102(e) Date Oct. 3, 1989, PCT Pub. No. WO88/08086, PCT Pub. Date Oct. 20, 1988
PCT Filed Mar. 26, 1988, Ser. No. 423,395
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1987, 3711492
Int. Cl.^{5} F15B *11/00;* **F16K** *15/00*
U.S. Cl. 91—516 **5 Claims**

1. A hydraulic pressure-control device, for a powershift transmission of a motor vehicle, comprising a fluid pump (**1**) being connected, via a pressure pipe (**3**), to a main pressure valve (**4**), for regulating the pressure in at least one high-pressure consumer device (**6**) connected to said pressure pipe (**3**), said main pressure valve (**4**) functioning as a pressure-relief valve and being biased into a closed position by a compression spring and being movable into an opened position by pressurized fluid of said pressure pipe (**3**), and said main pressure valve (**4**) being connected to a drain pipe (**7**) leading to at least one low-pressure consumer device (**8**), wherein

said main pressure valve comprises a valve piston (**21**), movable in a valve bore (**22**) of a valve housing (**23**), for controlling throttled flow of pressurized fluid, through a throttle site, and unthrottled flow of pressurized fluid from said pressure pipe (**3**) to said drain pipe (**7**),

said valve piston (**21**) is biased into a closed position by two



compression springs (**17, 18**) connected in parallel with one another, one of said compression springs (**18**) is bound while the other of said compression springs (**17**) is unbound,

during the throttled flow of pressurized fluid the bound compression spring (**17**) is at least partially compressed and during the unthrottled flow of pressurized fluid both compression springs (**17, 18**) are at least partially compressed, and

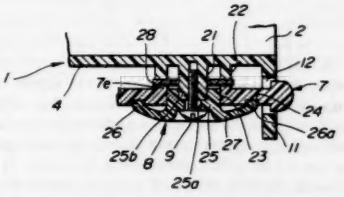
the movement (**19**) of said valve piston (**21**) required in moving from its initial position until an initiation of compression of the bound compression spring (**18**) is smaller than the movement (**20**) of said valve piston (**21**) required to allow the unthrottled flow of pressurized fluid from said pressure pipe (**3**) to said drain pipe (**7**).

5,069,112

DAMPER CONTROL ARRANGEMENT

Yukio Takayama, and Yuko Yuge, both of Shizuoka, Japan, assignors to Nihon Plast Co., Ltd., Shizuoka, Japan

Filed Jun. 7, 1989, Ser. No. 362,807
Int. Cl.^{5} G05G *5/06;* **B60H** *1/00*
U.S. Cl. 98—69 **10 Claims**



1. A damper control arrangement comprising:

first means for causing angular displacement of a damper louver according to angular position thereof;

second means, including a member extended from a damper housing which pivotally houses said louver, for permitting manual access, for adjusting the angular position of said louver;

third means for supporting said second means in a manner

permitting angular displacement thereof, said third means having an end surface establishing frictional engagement with a first surface of said second means; and

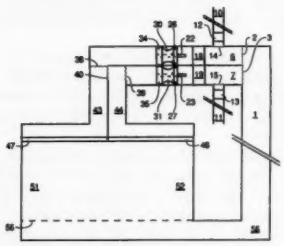
fourth means, provided at a side opposite to said third means with respect to said second means, for exerting depressing force for depressing said second means toward said third means, and said fourth means including a center boss section about which said second means is permitted to cause angular displacement and an annular contact section formed concentrically to the center boss section and having a surface contacting with a second surface of said second means lying opposite to said first surface for establishing frictional contact.

5,069,113

STACKED AND CROSS-CONNECTED RECIRCULATING FANS IN A SEMICONDUCTOR MANUFACTURING CLEANROOM

Brian J. Mattson, and Chester N. Edwards, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Continuation-in-part of Ser. No. 433,155, Nov. 8, 1989, now U.S. Pat. No. 4,960,845.
Filed Jun. 4, 1990, Ser. No. 533,195
Int. Cl.[5] F24F *13/00;* **F04B** *17/00*
U.S. Cl. 454—252 **18 Claims**



1. An apparatus for moving a gas comprising:

a) a first fan and a second fan;

b) a first fan chamber housing the first fan and a second fan chamber housing the second fan, the fan chambers being stacked vertically;

c) an intake and an outlet connected to the first fan chamber and an intake and an outlet connected to the second fan chamber;

d) means for preventing the backflow of the gas back through the first and second fan outlets; and

e) means for controlling the flow of gas between the first and second fan outlets such that the gas moving apparatus can be set to any of the three following conditions as desired: 1) the gas flows from the first fan outlet to the second fan outlet, thereby allowing the first fan to supply the gas to both the first fan outlet and the second fan outlet; 2) the gas flows from the second fan outlet to the first fan outlet, thereby allowing the second fan to supply the gas to both the second fan outlet and the first fan outlet; 3) gas flow between the first fan outlet and the second fan outlet is prevented.

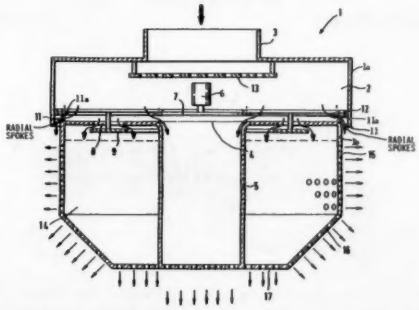
wherein the apparatus, when in an operation in which one fan is supplying the gas normally supplied by the other fan, has means for allowing the fan supplying the gas normally supplied by the other fan to output a total quantity of gas approximately equal to that which would be output when the gas moving apparatus is in an operational mode in which both fans are supplying gas.

5,069,114

DEVICE FOR INTRODUCING A LOW TURBULENCE DISPLACEMENT AIR FLOW INTO AN ENCLOSED SPACE

Franc Sodec, Wuerselen-Broichweiden, and Werner Veldboer, Stolberg, both of Fed. Rep. of Germany, assignors to H. Krantz GmbH & Co., Aachen, Fed. Rep. of Germany

Filed Oct. 19, 1990, Ser. No. 600,518
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1989, 3935620
Int. Cl.[5] F24F *13/06*
U.S. Cl. 454—297 **20 Claims**



1. A device for introducing a low turbulence displacement air flow into an enclosed space, comprising a housing having a first air inlet housing section (**1***a*) enclosing an air distribution volume (**2**), air inlet means (**3**, **3***a*) leading into said first housing section (**1***a*) for admitting fresh air into said air distribution volume (**2**), a second air outlet housing section (**1***b*) operatively connected to said first housing section for feeding a fresh air flow into said enclosed space, first air passage means (**4**, **8**) leading from said air distribution volume (**2**) in said first housing section (**1***a*) into said second housing section (**1***b*), second air passage means (**11**) leading out of said first housing section for forming an air flow skirt around an outer surface of said second housing section (**1***b*), air flow control means (**7**, **9**, **12**) for controlling an air flow through said first and second air passage means (**4**, **8**, **11**), a core pipe (**5**) having open ends and a closed side wall concentrically arranged in said second housing section (**1***b*), said first air passage means having a central air passage (**4**) concentrically aligned with an upper open end of said core pipe, said second housing section (**1***b*) having a perforated side wall (**15**) surrounding said core pipe to form a ring space (**5***a*), said first air passage means further having at least one radially outer air passage (**8**) leading into said ring space (**5***a*), and means (**6**) for operating said air flow control means (**7**, **9**, **12**) to distribute volume proportions of fresh air from said air distribution volume (**2**) into said core pipe (**5**) into said ring space (**5***a*), and around said perforated side wall in accordance with fresh air requirements.

5,069,115

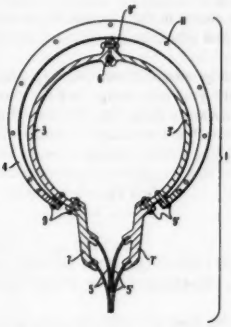
EXHAUST-GAS REMOVAL DUCT FORMED FROM INDIVIDUAL AXIALLY MUTUALLY ADJACENT SECTIONS FOR TRACK-FORMING LANES

Horst Fleischer, Weinstadt, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Fed. Rep. of Germany

Filed Jul. 18, 1990, Ser. No. 553,618
Claims priority, application Fed. Rep. of Germany, Jul. 22, 1989, 3924294
Int. Cl.[5] E21F *1/04*
U.S. Cl. 454—166 **20 Claims**

1. Exhaust-gas removal duct formed from individual axially mutually adjacent sections for track-forming lanes, having a longitudinal slot closed by a pair of elastic sealing lips, and at least one yoke sheet per section arranged transverse to the axis

of the duct and surrounding the removal duct on the outer circumference up to the longitudinal slot, wherein each section is formed from two channel-shaped shells which are in each case joined to each other leaktightly at only one pair of common longitudinal edges, and wherein the yoke sheet is connected to the channel-shaped shells only in the region of the pair of common longitudinal edges and in the region of the sealing lips.

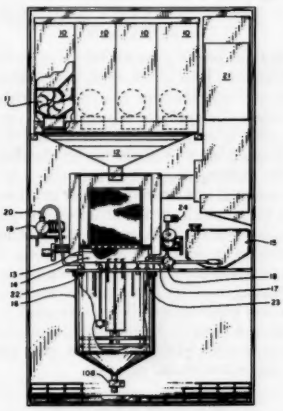


5,069,116

APPARATUS FOR FRYING FOODS

Al H. Marquez, San Jose; James A. Way, Cupertino, and G. Mark Remelman, Fremont, all of Calif., assignors to Hot Snacks, Inc., San Jose, Calif.

Filed Oct. 24, 1989, Ser. No. 426,104
Int. Cl.[5] A47J *37/12*
U.S. Cl. 99—330 **21 Claims**



1. An apparatus for frying food products in an oil comprising:

a cooking chamber containing said food products;

a heating chamber for holding a predetermined quantity of said oil;

a hollow shaft coupling said cooking chamber to said heating chamber;

a means for heating said oil within said heating chamber to a predetermined cooking temperature;

a means for forcing said oil from said heating chamber, through said hollow shaft, into said cooking chamber during a cooking cycle to cook said food products in said oil; and

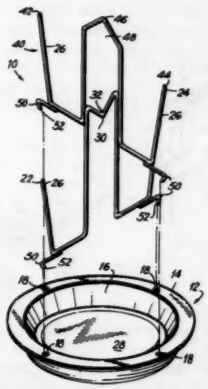
a means for returning said predetermined quantity of said oil to said heating chamber at the end of said cooking cycle.

5,069,117

MULTI-PURPOSE POULTRY ROASTER AND BAKING RACK

Walter Schlessel, Hewlett Neck, N.Y., assignor to Gemco Ware, Inc., Freeport, N.Y.

Filed Nov. 6, 1990, Ser. No. 609,582
Int. Cl.[5] A47J *43/18*
U.S. Cl. 99—419 **7 Claims**



1. A multi-purpose baking and roasting rack, comprising:

a detachable drip pan having a raised peripheral rim circumferentially extending about a downwardly recessed interior surface, and a center;

a first wire element, having two upstanding ends, said first wire element curving downward from said ends of said first wire element in a substantially vertical direction, then bending in a substantially horizontal direction towards said center of said drip pan to form a lower horizontal portion, then bending upwards in a substantially vertical direction, and then bending inwards towards said center of said drip pan to meet at a middle point of said first wire element;

a second wire element, having two upstanding ends, said second wire element curving downward from said ends of said second wire element in a substantially vertical direction, then bending in a susbstantially horizontal direction towards said center of said drip pan to form a lower horizontal portion, then bending upwards in a substantially vertical direction, and then bending inwards towards said center of said drip pan to meet at a middle point of said second wire element;

means for removably affixing said first wire element and said second wire element to said drip pan; and

means for stabilizing said first wire element and said second wire element.

5,069,118

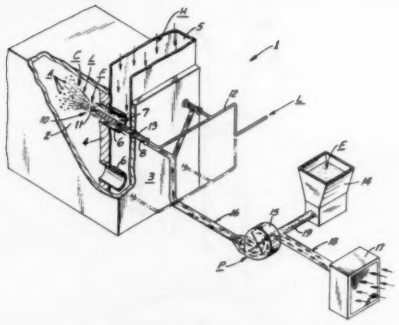
MECHANISM AND METHOD FOR AGGLOMERATING FOOD POWDERS

Dwight H. Bergquist; Gary D. Lorimor, and Thomas E. Wildy, all of Omaha, Nebr., assignors to Henningsen Foods, Inc., White Plains, N.Y.

Filed Jan. 16, 1990, Ser. No. 465,461
Int. Cl.[5] A23C *3/00, 9/00, 9/16*
U.S. Cl. 99—453 **12 Claims**

1. A spray drying mechanism for agglomerating powdered food comprising a drying chamber, a spray nozzle extending into the said drying chamber, means for supplying said spray

nozzle with an agglomerating medium, means for causing said spray nozzle to spray said agglomerating medium into said drying chamber, means for directing powdered food into said drying chamber, said powdered food directing means comprising means for impinging the powdered food against the agglomerating medium being sprayed from the spray nozzle into the drying chamber in order to agglomerate the powdered food, means being provided to spray said agglomerating medium into the drying chamber in a cone-shape configuration and wherein means are provided to impinge said powdered food against the cone-shaped configuration of the agglomerat-



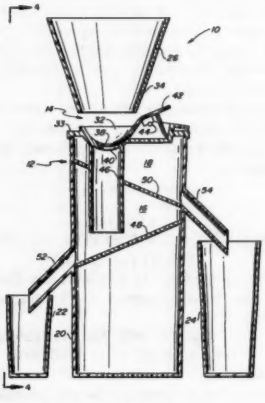
ing medium, the said spray nozzle being located in front of the powdered food directing means so that powdered food is impinged against the rear of the cone-shaped configuration, said spray nozzle having a feed pipe extending rearwardly therefrom and said powdered food directing means being a conduit surrounding the spray nozzle feed pipe in spaced relationship thereto to form a space between which the powdered food moves, a hot air tube extending into said drying chamber, means for directing hot air into the drying chamber through said hot air tube, said powdered food conduit being mounted within and in axial spaced relationship to said hot air tube.

5,069,119

EGG SEPARATOR

Olajire Idowu, 1734 Mettler Rd., Lodi, Calif. 95242

Filed Oct. 29, 1990, Ser. No. 605,246
Int. Cl.[5] A23J *1/09*; A47J *43/14*
U.S. Cl. 99—499 **6 Claims**



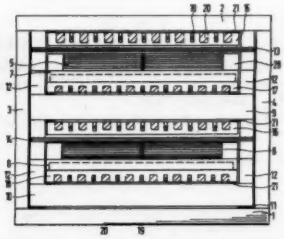
1. An egg separator comprising
a unitary housing,
means in an upper portion of the housing for receiving an egg and separating the yolk and albumen of the egg,
a cup-shaped member sized for retaining the yolk and for causing the albumen to overflow the cup-shaped member,
first and second chamber means formed in lower portions of the housing,
intermediate means in the housing for respectively directing the yolk and albumen to the first and second chamber means,
means movably mounted on the cup-shaped member for breaking the yolk into an opening for allowing the yolk to flow downwardly from the cup-shaped member, and
a slot adjacent the cup-shaped member for directing the albumen to the second chamber means and passage means beneath the opening in the cup-shaped member for directing the yolk to the first chamber means.

5,069,120

APPARATUS FOR PRESSING MULTILAYER PACKS

Klaus Schneider, Stephanstrasse 30, D-1000 Berlin 21, Fed. Rep. of Germany

Filed Dec. 18, 1989, Ser. No. 452,514
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1988, 3844498
Int. Cl.[5] B30B *15/34, 7/02*
U.S. Cl. 100—93 P **6 Claims**



1. Apparatus for pressing multilayer packs by vacuum application and isotactic heat action with a plurality of superimposed stages in a pressure-type chamber, the chamber having sidewalls, means for applying a vacuum in the chamber, a multi-layer pack in each stage, means for heating each pack, means for cooling each pack, an elastic membrane means in each stage for exerting pressure on the pack, a bottom plate in each stage mounted in a floating manner in which the plate is not fixed to the sidewalls of the chamber, the plate being the flatness standard for the pack and the plate being exposed to the same pressure on either side during pressing, the means for heating the pack and the means for cooling the pack including an upper heating/cooling plate located above and a lower heating/cooling plate located below the pack in each stage, and each bottom plate being thermally insulated against the lower heating/cooling plate, the bottom plate remaining cool when the pack is heated and pressed.

5,069,121

APPARATUS HAVING PIVOTABLE ARM FOR CRUSHING CANS

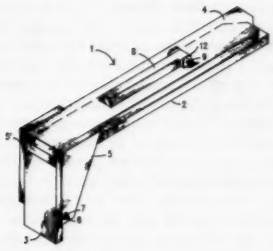
John S. Fletcher, 1508 58th St. North, St. Petersburg, Fla. 33710

Filed Jul. 5, 1990, Ser. No. 548,268
Int. Cl.[5] B30B *7/00, 1/04*
U.S. Cl. 100—137 **12 Claims**

1. A can crushing device comprising:
(a) a base plate having a width sufficient to accommodate thereon the length of the can to be crushed thereon, having a length substantially greater than the width and having at least one leg extending perpendicularly downward from one end thereof for a distance of 6 to 18 inches;
(b) an arm having a width sufficient to cover the length of

the can to be crushed, having a length sufficient to give the leverage required for crushing the can, and having at least one leg extending perpendicularly downward from one end thereof for a distance of at least 6 inches, said arm having the other end of said arm unattached, and said leg on said arm being positioned adjacent to said leg on said base plate;

(c) a pivoting means positioned at least 6 inches below said base plate and connecting said leg on said arm to said leg on said base plate, and adapted to allow said arm to lay flat



on said base plate and also to allow said arm to be moved away from said base plate by lifting the unattached end of said arm away from said base plate, whereby a can positioned on said base plate between said base plate and said arm can be crushed by a force applied to the unattached end of said arm and directed toward said base plate;

said device further including a bar having a width of 1.5–2 inches and a fulcrum means whereby said bar is adapted to cave in the side of the can to be crushed said bar being positioned at a convenient location on said device.

5,069,122

THERMAL MARKING DEVICE FOR WEBS OF MINERAL WOOL AND A METHOD OF APPLYING THE MARKINGS

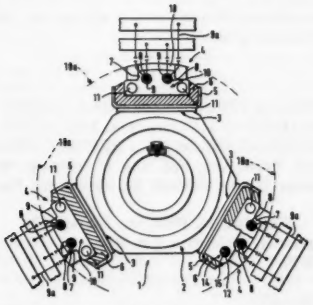
Friedrich Kaufmann, Limburgerhof; Horst-Werner Schlossherr, Dudenhofen, and Egon Zinn, Meckenheim, all of Fed. Rep. of Germany, assignors to Isover Saint-Gobain, Courbevoie, France

Filed Mar. 12, 1990, Ser. No. 492,493

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1989, 3908128

Int. Cl.[5] B44B *5/02*

U.S. Cl. 101—9 **12 Claims**



1. A thermal marking device for marking binder containing webs of mineral wool, comprising:

a roller rotatable about an axis;

at least one marking element mounted on said roller, each said marking element including an image panel and a plurality of marking sections projecting from said image panel by at least 5 mm, said marking sections being configured in a pattern corresponding to at least a portion of an image to be marked on the webs, wherein said marking sections define an envelope curve which substantially corresponds to the peripheral surface of an imaginary cylinder centered on said roller axis;

a heat insulating block mounted to the roller and means for slidably mounting each said at least one marking element on the roller via the heat insulating block; and

means for heating each said marking element.

5,069,123

PRINT WHEEL PRINTER HAVING SEPARABLE TRIGGER CASING AND MAIN HOUSING

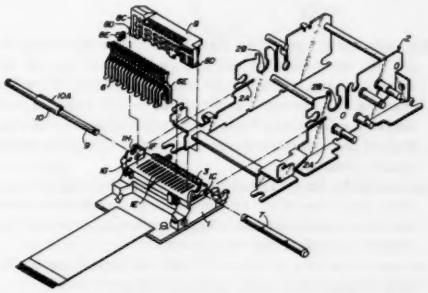
Sadao Murata; Yasuhiro Harada, and Susumu Hama, all of Suwa, Japan, assignors to Seiko Epson Corporation, Japan

Filed Apr. 16, 1990, Ser. No. 509,482

Claims priority, application Japan, Apr. 17, 1989, 1-44813[U]; Apr. 17, 1989, 1-97175; Apr. 25, 1989, 1-48455[U]; Apr. 25, 1989, 1-48456[U]

Int. Cl.[5] B41J *1/32*

U.S. Cl. 101—93.21 **5 Claims**



1. A print wheel printer comprising a trigger unit casing and a main housing frame, a plurality of print wheels rotatably mounted on a print wheel shaft and having a corresponding ratchet wheel secured to one side of each of said print wheels, a plurality of rotatably mounted selective pawls supported on said casing for stopping the rotation of said print wheels at selected print wheel engagement positions wherein a corresponding pawl is rotated into position to engage a corresponding ratchet wheel, a rotatable reset lever supported on said casing to return said selective pawls to a print wheel disengagement position, said selective pawls and said reset lever supported on said casing in a prealigned relationship, means on said main housing frame for supporting said print wheels, and interengagement means on said casing and said main housing frame for securing said casing onto said main housing frame whereby positional alignment of said casing selective pawls relative to said housing print wheel ratchet wheels is achieved without need for further after assembly adjustment.

5,069,124

METHOD OF OPERATING A PRINTING MACHINE DURING START-UP OR RUN-ON AND OPTICALLY TESTING A PRINTED IMAGE

Josef Schneider, Diedorf-Lettenbach, Fed. Rep. of Germany, assignor to Man Roland Druckmaschinen AG, Offenbach am Main, Fed. Rep. of Germany

Filed Mar. 20, 1990, Ser. No. 495,416

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1989, 3910557

Int. Cl.[5] B41F *7/18*

U.S. Cl. 101—142 **20 Claims**

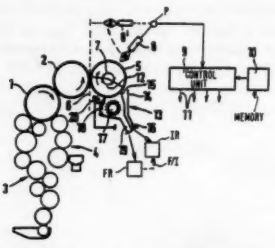
1. Method of operating a printing machine during start-up or run-on and to eliminate printing of scrap products while ad-

justing the machine, wherein the printing machine has a printing cylinder (2, 24, 34) positioned for printing information on a substrate (6, 25, 33) during a printing run,

comprising the steps of

preliminarily, and in advance of the printing run by the printing machine, transferring information to be printed from the printing cylinder (2, 24, 34) onto a control or test cylinder (5, 26, 35) to form an image thereof on the control or test cylinder,

wherein said printing cylinder and said control or test cylinder are in printing engagement at a cylinder contact line;



optically testing, at a first partial circumferential range (7, 27, 36) subsequent to the cylinder contact line of the control or test cylinder, the image transferred from the printing cylinder onto said control or test cylinder, and deriving information from the printed image on said control or test cylinder within said range relative to print quality parameters;

removing the image transferred from the printing cylinder onto said control or test cylinder at a selected partial circumferential range (12, 29, 38) subsequent to said first partial circumferential range; and

printing from said printing cylinder on the substrate after said testing step and during the printing run.

5,069,125

ROTARY GRAVURE PRINTING MACHINE

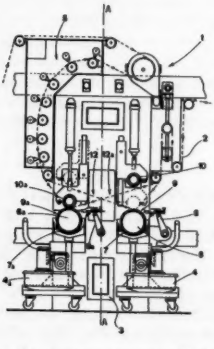
Vito Schiavi, Piacenza, Italy, assignor to Schiavi Cesare Costruzioni Meccaniche S.p.A., Milan, Italy

Filed Sep. 15, 1989, Ser. No. 407,917

Claims priority, application Italy, Oct. 5, 1988, 40145 A/88

Int. Cl.[5] B41F *9/18*

U.S. Cl. 101—152 **3 Claims**



1. A print station for a rotary gravure printing machine, the print station comprising:

means defining a first bay and a second bay, the first and second bays being symmetrically disposed adjacent to each other;

a first print cylinder, the first print cylinder being received by the first bay and being removable therefrom;

a second print cylinder, the second print cylinder being received by the second bay and being removable therefrom;

a first impression cylinder, the first impression cylinder being situated adjacent to the first bay;

a second impression cylinder, the second impression cylinder being situated adjacent to the second bay;

a web;

means for moving said first and second impression cylinders between a first position wherein said first impression cylinder adjoins said first print cylinder and said second impression cylinder is spaced apart from said second print cylinder and a second position wherein said first impression cylinder is spaced apart from said first print cylinder and said second impression cylinder adjoins said second print cylinder, said first impression and print cylinders being operative with respect to said web while said first and second impression cylinders are in said first position, said second impression and print cylinders being operative with respect to said web while said first and second impression cylinders are in said second position;

a first doctor for removing surplus ink from the first print cylinder, the first doctor being positioned adjacent to the first bay;

a second doctor for removing surplus ink from the second print cylinder, the second doctor being positioned adjacent to the second bay;

means for guiding said web through said first and second bays, said means for guiding including means for causing said web to travel through a first web route and means for altering the route of travel of said web such that said web is caused to pass through a second web route of travel, the first web route of travel being defined between the first impression cylinder and the first print cylinder when the first and second impression cylinders are in the first position, and the second web route of travel being defined between the second impression cylinder and the second print cylinder when the first and second impression cylinders are in the second position;

said means defining said first and second bays being configured and said means for guiding said web being arranged such that the first impression and print cylinders can engage said web and cause said web to travel along said first web route while the second print cylinder is removed from said second bay or while said first and second impression cylinders are in said first position, and said second impression and print cylinders can engage said web and cause said web to travel along said second web route while said first print cylinder is removed from said first bay or while said first and second impression cylinders are in said second position.

5,069,126

ELECTRICAL CIRCUIT-BREAKING DEVICE FOR PROTECTING A CLAMPING DEVICE OF A SHEET-GUIDING DRUM OF A PRINTING MACHINE

Willi Becker, Bammental, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen Ag, Heidelberg, Fed. Rep. of Germany

Filed Jan. 16, 1990, Ser. No. 465,804

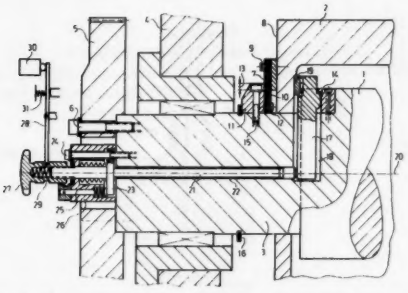
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1989, 3900820

Int. Cl.[5] B41F *5/04*

U.S. Cl. 101—230 **7 Claims**

1. Electrical circuit-breaking device for protecting a clamping device of a sheet-guiding drum of a printing machine having a machine part fixed against rotation, the clamping device having an actuating member formed with a thread and being turningly screwable therewith in a first travel phase and in a second travel phase over a given distance in axial direction between respective end positions, the circuit breaking device

comprising a switching member for an electrical switch connected in a power-supply circuit for driving the printing machine, said switching member being actuatable in the first travel phase of the actuating member, the sheet-guiding drum having a drum part adjustable thereon in circumferential direction thereof, means defining at least one friction surface on the sheet-guiding drum and at least one friction surface on said drum part, intermediate members for pressing said friction surfaces against one another, said intermediate members being actuatable in the second travel phase of the actuating member, stop means effective in turning direction of the actuating member including a cam on the actuating member, and a pair of cams mounted on said machine part fixed against rotation, said pair of cams, respectively, defining each of the end positions and being spaced from one another in the axial direction of the actuating member a distance greater than a thread pitch of the thread formed in the actuating member, said cam on the actuating member having an area overlapping at the respective end positions with a respective area of each cam of said pair of cams on the machine part fixed against rotation, the mutually overlapping areas being smaller in the axial direction than said thread pitch.

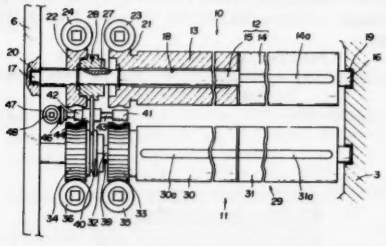


5,069,127

SPOT PRINTING METHOD IN ROTARY PRESS AND BLANKET CYLINDER FOR SPOT PRINTING

Takashi Iijima, and Shinji Kawashima, both of Kanagawa, Japan, assignors to Tokyo KiKai Seisakusho, Ltd., Tokyo, Japan

Continuation of Ser. No. 495,600, Mar. 16, 1990, abandoned. This application May 16, 1991, Ser. No. 703,571
Claims priority, application Japan, Mar. 18, 1989, 1-64960
Int. Cl.[5] B41F *1/28*
U.S. Cl. 101—415.1 **20 Claims**



1. A blanket cylinder assembly for particular use in spot printing by multiple blankets in a rotary press operation, comprising:

a. a blanket cylinder main body;

b. at least a pair of printing blanket members mountable on said cylinder body; and

c. blanket fitting means for selectively either;

(i) coupled, simultaneously tightening both of said blanket members on said cylinder body; or

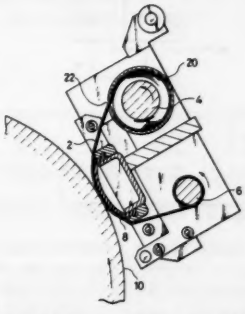
(ii) tightening one of said blanket members on said cylinder body independently of the other of said blanket members.

5,069,128

DEVICE FOR CLEANING A CYLINDER OF A PRINTING MACHINE

Akira Hara; Mitsunori Sukigara, both of Tokyo, and Toshisaburo Takagi, Urawa, all of Japan, assignors to B-J Trading Limited, Tokyo, Japan

Filed Apr. 4, 1989, Ser. No. 333,032
Claims priority, application Japan, Jun. 30, 1988, 63-163657
Int. Cl.[5] B41F *35/00*; B41L *41/00*
U.S. Cl. 101—425 **14 Claims**



1. A device for cleaning a cylinder of a printing machine, comprising:

an airtight cylindrical case, a cover and seal means at each end of said case,

a cleaning cloth supply roll contained in said case with its ends passing through said covers at said seal means;

a cleaning cloth take-up roll;

a strip cleaning cloth which is impregnated with cleaning liquid before being attached to said cleaning cloth supply roll, which is lodged in said case for supply and which after breaking the airtightness of said case is stretched between said cleaning cloth supply roll and said cleaning cloth take-up roll; and

means for pressing said cleaning cloth against the outer periphery of the cylinder of the printing machine.

5,069,129

IGNITING APPARATUS FOR EXPLOSIVE SUBSTANCES

Shigeaki Kunitomo, Nakanocho 580.581 Ban Gacchi, Teramachi-dori Bukkoji Agaru, Shimogyo-ku, Kyoto, Japan

Filed Nov. 7, 1990, Ser. No. 610,089
Int. Cl.[5] F42D *1/055*
U.S. Cl. 102—200 **1 Claim**

1. A program-controlled automatic ignition system for pyrotechnics, comprising:

a) a number of ignition circuits for igniting pyrotechnic devices, said circuits being divided into a plurality of groups;

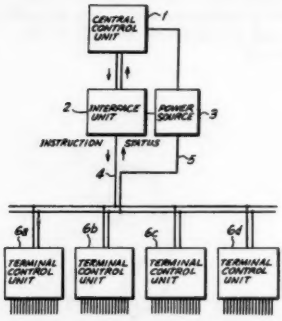
b) a plurality of terminal control units disposed in proximity to the pyrotechnic devices for managing said plurality of groups of said number of ignition circuits and for controlling said ignition circuits individually while monitoring the loaded state of the pyrotechnic devices on the ignition circuits;

c) a central control unit for controlling said ignition circuits through said terminal control units according to a preset program to successively ignite the pyrotechnic devices;

d) an interface unit for transmitting instructions from said central control unit to the individual terminal control units;

e) a power source for said number of ignition circuits; and

f) each of said plurality of terminal control units including signal processing means comprising a microprocessor unit which is operable in accordance with the instructions of said central control unit, n-channel peripheral interface means connected to said signal processing means for n-ignition circuits constituting said group each of which consists of a channel driver and an ignition pellet of one of the pyrotechnic devices in circuit with said channel



driver, a channel selector connected to said signal processing means for preselecting at least one channel of said n-channel peripheral interface means, a unit-test switching means connected to said processing means for selectively testing at least one channel of said n-channel peripheral interface means, and unit power supply line conductors connected to said power source and said n-ignition circuits in sequential shunt relationship.

5,069,130

PROPELLANT IGNITER

Dieter Buckley, Nurmberg; Erhard Munster, Altdorf, and Wolfgang Schwarz, Nurmberg, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nurmberg, Fed. Rep. of Germany

Filed Nov. 2, 1990, Ser. No. 608,246

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1989, 3938123

Int. Cl.[5] F42B *5/02*

U.S. Cl. 102—202 **7 Claims**

1. Propellant igniter for a cartridge; including an ignition tub extending into a propellant for said cartridge; a booster charge being located at one end of said ignition but and having a pyrotechnic ignition charge therein leaving the presence of a central passageway, aid ignition charge being formed from a tubular, hardened layer constituted from a pyrotechnic lacquer; a gas cloud conduit tube being arranged coaxially within the ignition tube, and slots in said gas cloud conduit, the width of aid slots increasing in a direction toward the end of said conduit tube which is distance from the booster charge.

5,069,131

PRIMER

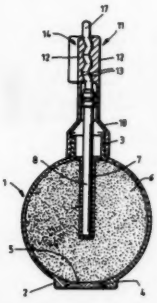
David Kennedy, Rosanna; Gerard Mussett, Elwood; Alfons Van Maanan, St. Kilda, and James N. Smetham, Kalgoorlie, all of Australia, assignors to ICI Australia Operations Proprietary Limited, Australia

Filed Sep. 25, 1989, Ser. No. 412,202

Claims priority, application Australia, Sep. 23, 1988, PJ0589

Int. Cl.[5] C06C *7/00*

U.S. Cl. 102—275.6 **8 Claims**



1. A primer for detonating explosives, the primer being fired by firing means which receives a firing signal via continuous elongate flexible transmission means directly connected to the firing means, the primer comprising a charge of explosive to which charge is appended an elongate neck, there being within the neck and the charge a continuous bore having an axis substantially parallel to a longitudinal axis of the neck and dimensioned so as to accommodate said firing means to an extent which ensures at least one of protection of said firing means and an efficient functioning of said firing means, the neck comprising, at an end thereof remote from the primer charge, fastening means for fastening the primer to the transmission means such that the primer can be fully supported by said transmission means and wherein there is within the primer explosive charge a hollow insert having a bore of a diameter which permits a firm fitting of the firing means.

5,069,132

WATER-IN-OIL TYPE EMULSION EXPLOSIVE ENVELOPE

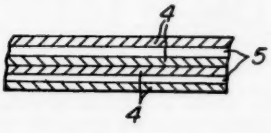
Shigeru Kakino; Tatsushi Nakamura, both of Chita; Toshinori Tamari, Konan, and Masao Takahashi, Chita, all of Japan, assignors to Nippon Oil and Fats Company, Limited, Tokyo, Japan

Filed Dec. 18, 1990, Ser. No. 629,561

Claims priority, application Japan, Jan. 10, 1990, 2-506[U]

Int. Cl.[5] F42G *3/00*

U.S. Cl. 102—331 **3 Claims**



1. A water-in-oil type emulsion explosive envelope comprising a water-in-oil type emulsion explosive and a paper wrapping the explosive, wherein said paper is coated at at least one surface thereof with a low-temperature melt resin having a melting point of 50°–95° C. in an amount of 5–30 g/m^2 and wrapped double so as to adhere joint faces to each other through heat.

5,069,133

ELASTOMER-CONTAINING CASINGS FOR PROPELLANTS

J. B. Canterberry, Auburn Hills, Mich., and Terry A. Murray, Quincy, Fla., assignors to Olin Corporation, Cheshire, Conn.

Filed Aug. 31, 1990, Ser. No. 576,576
Int. Cl.[5] F42B *3/00*; C06D *1/08*
U.S. Cl. 102—332 8 Claims

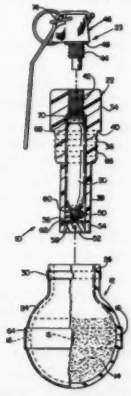
1. A process for producing an encased propellant which comprises overwrapping in the presence of the propellant at least one charge of propellant with an elastomeric coating composition free of any cellulosic compound.

5,069,134

FLAMELESS EXPULSION GRENADE

Barry D. Pinkney, Jefferson, Ohio, assignor to Def-Tec Corporation, Rock Creek, Ohio

Filed Jun. 8, 1990, Ser. No. 535,466
Int. Cl.[5] F42B *12/46*
U.S. Cl. 102—368 27 Claims



1. A flameless expulsion grenade comprising a container containing a powdered agent and having container outlet means, a cartridge filled with pressurized gas positioned within said container, releasing means for releasing said pressurized gas from said cartridge to expel said powdered agent out through said container outlet means, and a grenade stem connected to said container, said grenade stem including a cartridge chamber containing said cartridge, and vent means in said grenade stem communicating said cartridge chamber with a surrounding space defined by said container for exiting said pressurized gas from said chamber into said surrounding space.

5,069,135

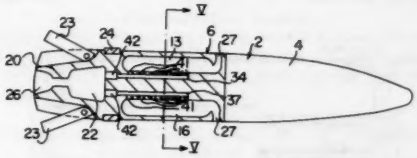
IGNITION SYSTEM

Sven-Eric Johansson; Ulf Melhus, both of Karlskoga, and Lennart Selin, Kristinehamn, all of Sweden, assignors to Aktiebolaget Bofors, Karlskoga, Sweden

Filed Dec. 7, 1989, Ser. No. 447,472
Claims priority, application Sweden, Dec. 8, 1988, 8804426
Int. Cl.[5] F42B *10/66, 15/10*; C06C *5/00*
U.S. Cl. 102—380 10 Claims

1. An ignition device for elongate main propellant powder charges such as gas generators for trajectory-correcting impulse motors, the ignition device comprising:

a fast-burning or detonating fuse positioned along each elongate main propellant powder charge, said fast-burning or detonating fuse being arranged to communicate with at least portions of a surface of the elongate main propellant charge, said fast-burning or detonating fuse including a fast-burning layer surrounding an inner core which contains a slower burning powder, said fast-burning layer being adapted for instantaneous ignition along its entire length, and for providing cross-ignition along a corresponding length of both the propellant charge and the



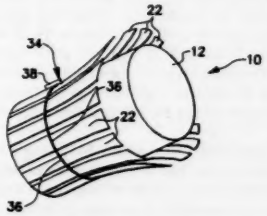
inner core, wherein the slow burning inner core further ensures complete cross-ignition of the main propellant charge.

5,069,136

TWO-STAGE RELEASE MECHANISM AND METHOD FOR SELF-RIGHTING A LOAD

Eric T. Axelson, Minnetonka, and Thomas P. Mathews, Plymouth, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 14, 1990, Ser. No. 582,566
Int. Cl.[5] F42B *23/24*
U.S. Cl. 102—425 13 Claims



1. A two-stage release self-righting mechanism for use in erecting a load from a side position to an upright position, said mechanism comprising:

(a) an array of spring legs for attachment to the load and extending in circumferentially spaced relation to one another, said spring legs being yieldably and resiliently flexible from a fully deployed position to a fully stowed position for storing energy when disposed at said stowed position; and

(b) a pair of primary and secondary releasable holder assemblies for holding upper and intermediate portions of said spring legs in said fully stowed position against the load such that release of said primary holder assembly releases an initial portion of energy stored by said spring legs so as to cause them to partially extend from said stowed position to a partially deployed position and partially erect the load, whereas release of said secondary holder assembly a predetermined period of time after release of said primary holder assembly releases a remaining portion of energy stored by said spring legs so as to cause them to fully extend to said fully deployed position and complete the erecting of the load.

5,069,137

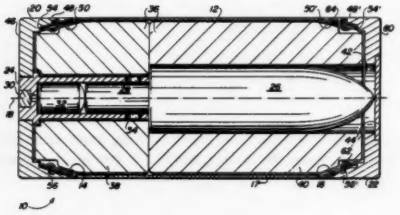
CASED TELESCOPED AMMUNITION ROUND

Wilford E. Martwick, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 17, 1990, Ser. No. 524,605

Int. Cl.[5] F42B *5/045*

U.S. Cl. 102—434 **12 Claims**



1. A cartridge case **64** for a cased telescoped ammunition round **10** comprising:

an outer skin **12** having an outer surface, a rear end portion **14**, a front end portion **16**, and an axis of symmetry **18**, said outer skin **12** being fabricated from a material which undergoes elastic deformation when round **10** is fired; and said outer skin **12** having a plurality of curved spring fingers **62** formed in the end portions **14**, **16** of the outer skin **12**, each finger **62** having a free end **66** with only the free end of each finger **62** projecting beyond the outer surface of outer skin **12**;

a rear seal **20**;

a front seal **22**;

the real seal **20** and the front seal **22** each having a base **46**, **60** and an annular side wall **48**, **48'**; each side wall **48**, **48'** of seals **20**, **22** having a cylindrical outer surface, and an inner surface **50**, **50'** terminating in a lip **52** **52'**, catch means **56**, **56'** formed in the inner surface **50**, **50'** of the side wall **48**, **48'** of each seal **20**, **22**; the rear portion **14** of outer skin **12** fitting into rear seal **20** with the outer surface of rear portion **14** substantially contacting the inner surface **50** of rear seal **20** and front portion **16** of outer skin **12** fitting into front seal **22** with the outer surface of front portion **16** substantially contacting the inner surface **50'** of front seal **22**, the free ends **66** of spring fingers **62** projecting into catch means **56**, **56'** to secure seals **20**, **22** to outer skin **12**;

a hollow cylindrical control tube **24** having a front end and a rear end, the rear end of control tube **24** being secured to the base **46** of rear seal **20** so that control tube **24** is substantially symmetrical with respect to axis **18**, the front end of the control tube **24** being spaced from front seal **22**; and

primer means **30** mounted in the base of the rear seal.

5,069,138

ARMOR-PIERCING PROJECTILE WITH SPICULATING CORE

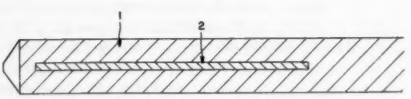
Lars Ekbom, Granitvägen 16, S-186 35 Vallentuna, Sweden

Filed Jan. 2, 1990, Ser. No. 459,489

Claims priority, application Sweden, Jan. 2, 1989, 8900012

Int. Cl.[5] F42B *12/06*

U.S. Cl. 102—518 **7 Claims**



1. An armour-piercing elongated arrow style projectile in the form of a substantially rotation symmetrical projectile body including a core centrally disposed and aligned in the longitudinal direction of the projectile, which comprises a core and surrounding projectile body wherein the core is of a material which, under the penetration conditions prevailing for armour penetration, has a hardness which is greater than twice the hardness of the material in the surrounding projectile body; that the entire length of the core is of a diameter which is between 5 and 25 percent of the largest diameter of the symmetrical projectile body and a length which is between 400 and 4000% of the largest diameter of the projectile body; and that the core is fixedly secured in the surrounding projectile body.

5,069,139

PROJECTILE INTENDED TO BE FIRED BY A FIRE-ARM

Jean-Pierre Denis, 5, via Clément Ader, F-78140 Velizy, France

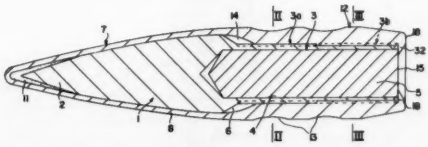
PCT No. PCT/FR88/00491, § 371 Date Jun. 2, 1989, § 102(e) Date Jun. 2, 1989, PCT Pub. No. WO89/03015, PCT Pub. Date Apr. 6, 1989

PCT Filed Oct. 4, 1988, Ser. No. 362,439

Claims priority, application European Pat. Off., Oct. 5, 1987, 87 402203.1; Oct. 23, 1987, 87 402392.2

Int. Cl.[5] F42B *12/06, 14/04*

U.S. Cl. 102—518 **18 Claims**



1. A projectile for a rifled firearm, comprising a hard core (**1**) surrounded by a continuous jacket (**7**) of ductile material adapted to cooperate with rifling in the firearm, said core having a nose, a head (**2**) of ogival shape and an integral substantially cylindrical tail (**3**), said core being shaped to define a shoulder (**6**) between said head and said tail, said jacket including a first portion (**8**) which overlies said nose and head of said core, said jacket including an integral second portion (**12**) which overlies said tail of said core, said second portion having a greater thickness than said first portion of said jacket, an outer surface of said second portion of said jacket having undulations which form circular grooves (**13**) at substantially right angles to the longitudinal axis of the projectile, an interior surface of said jacket adjacent said shoulder being shaped to define a free space (**14**) between said interior surface and said shoulder, anchoring means (**9**) disposed between an exterior surface of said tail and an interior surface of said second portion of said jacket for locking said jacket and core to one another so that, when said projectile is fired, said core and jacket will be propelled and rotated as a unitary body, said cylindrical tail of said core defining an interior cavity (**4**), and an inertia block (**5**) disposed within said cavity, the sizes and shapes of said cavity and inertia block being such that said inertia block substantially fills said cavity.

5,069,140

LOADING AND UNLOADING ARRANGEMENT FOR A CABLE TRANSPORTATION SYSTEM

Paul Glassey, Sornard, CH-1961 Haute-Nendaz, Switzerland

Filed Oct. 7, 1988, Ser. No. 254,682

Claims priority, application Switzerland, Oct. 15, 1987, 4044/87-6

Int. Cl.[5] B61B *1/00, 11/00;* B61J *3/00*

U.S. Cl. 104—28 **7 Claims**

1. In a transportation system including

a continuously moving traction cable;

a plurality of carriers connectable to and disconnectable from the traction cable;

a station for receiving, loading, unloading and dispatching

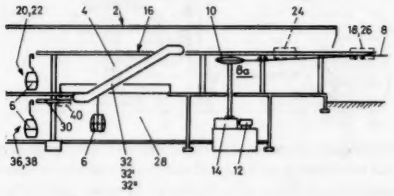
the carriers; said station having a carrier entrance side and a carrier exit side;

an uncoupling zone at said entrance side for disconnecting each carrier from said traction cable;

a coupling zone at said exit side for reconnecting each carrier to said traction cable;

an unloading zone and a loading zone situated between said uncoupling zone and said coupling zone; said unloading and loading zones being situated at a first level in said station;

a transfer rail assembly extending from said uncoupling zone to said coupling zone through said unloading and loading zones for guiding the carriers disconnected from said traction cable;



the improvement comprising

(a) an additional unloading zone and an additional loading zone situated between said uncoupling zone and said coupling zone at a second level; said second level being located at a height different from said first level;

(b) an additional transfer rail assembly connecting said additional unloading and loading zones with one another; and

(c) a conveyor assembly connecting said uncoupling zone with said additional unloading zone and connecting said additional loading zone with said coupling zone for advancing the carriers from the uncoupling zone to the additional unloading zone and from the additional loading zone to the coupling zone.

5,069,141

OVERHEAD CONVEYOR WHICH PROVIDES INCREASED REACTIVE FORCE AND TRACTION TO DRIVE WHEEL ON ASCENDING RAIL SECTIONS

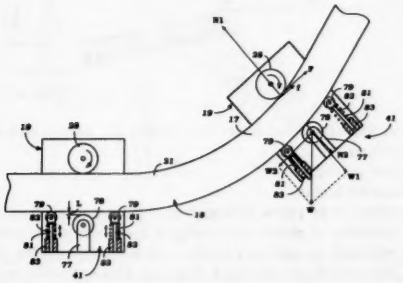
Osamu Ohara; Hiroshi Takata, and Hiroshi Kawashima, all of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Aug. 9, 1989, Ser. No. 391,476

Claims priority, application Japan, Aug. 10, 1988, 63-199721

Int. Cl.[5] B61C *13/04*

U.S. Cl. 105—30 **18 Claims**



1. A conveyor mechanism comprised of a guide rail defining a path along which articles are to be conveyed, a drive mechanism supported on said guide rail and having a frictional drive wheel engaged with said guide rail, said drive wheel and said guide rail having a constant cross-sectional area of engagement along said path, said guide rail being formed with at least an ascending section extending upwardly from a horizontal section, and means for providing an increased reactive force of said drive wheel along said path only when traveling along said ascending section.

5,069,142

COLLAPSIBLE TABLE

Vigbjørn Matre, Ormerudveien 59A, N-1410 Kolbotn, Norway

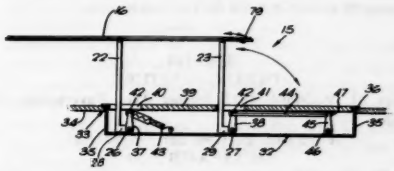
PCT No. PCT/NO89/00077, § 371 Date Feb. 13, 1991, § 102(e) Date Feb. 13, 1991, PCT Pub. No. WO90/00868, PCT Pub. Date Feb. 8, 1990

PCT Filed Jul. 26, 1989, Ser. No. 651,218

Claims priority, application Norway, Jul. 27, 1988, 883318

Int. Cl.[5] A47B *23/00*

U.S. Cl. 108—42 **10 Claims**



1. A collapsible table comprising a table top (**16**; **53**), a base member (**32**; **57**) and a number of supporting legs (**22**, **23**; **58**, **59**) which at one end are pivotally connected to the table top and at the other end are pivotally connected to the base member, the table (**15**; **52**) being arranged for assembly in an opening (**33**) in the floor (**34**) at the place of use of the table, and to be placed in a collapsed position wherein the table top (**16**; **53**) forms part of the floor surface, CHARACTERIZED IN that the base member (**32**; **57**) is an upwards open, essentially box-like member which is arranged for assembly in said floor opening (**33**), the lower ends of the legs (**22**, **23**; **58**, **59**) being mounted at a bottom portion of the base member (**32**; **57**) and the base member having side walls (**35**; **80**) of such a height that the table top (**16**; **53**) in said collapsed position is flush with the floor surface, and that supporting members (**37**, **38**; **70**, **71**) are provided in connection with the lower ends of the legs (**22**, **23**; **58**, **59**), which members are arranged to support a plate-shaped floor element (**39**; **72**) for covering said floor opening (**33**), so that the floor element in said collapsed position of the table (**15**; **52**) is located between the legs (**22**, **23**; **58**, **59**) and the supporting members (**37**, **38**; **70**, **71**), and in the erected position of the table is raised to the level of the floor surface by means of the supporting members.

5,069,143

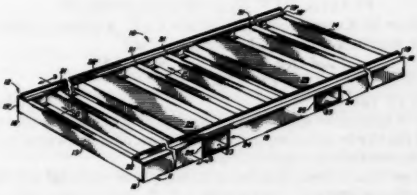
DUAL PURPOSE PLATFORM FOR MOBILE STORAGE BUILDINGS

Richard E. Bunger, 1834 W. 3rd St., Tempe, Ariz. 85281

Filed May 28, 1991, Ser. No. 707,159

Int. Cl.[5] B65D *19/00*

U.S. Cl. 108—51.1 **6 Claims**



1. A platform for a movable building comprising:

a frame,

said frame comprising a pair of parallely arranged spacedly positioned rails and a plurality of parallely arranged spacedly positioned floor joists extending laterally of and between said rails,

said rails each defining a U-shaped opening for receiving therein a different end of each of said floor joists and a flange extending laterally and upwardly of each of said rails for providing an outwardly positioned supporting surface for a side of a building,

a pair of spacedly positioned channels parallely arranged with said floor joists between said rails, and

a pair of spacedly positioned openings arranged in each of said rails,

said channels each being positioned to axially align with one of said openings in each of said rails,

whereby when prongs of a forklift mechanism penetrate a pair of said openings in one of said rails and the associated channels the platform and any building mounted thereon may be moved by said forklift mechanism.

5,069,144

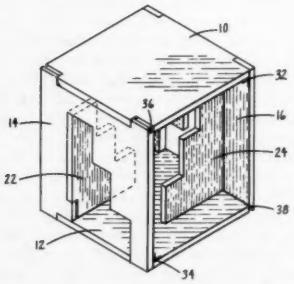
FOLDING FUNITURE

Jeffrey M. Williford, 1513 Paisley Ave., Fayetteville, N.C. 28304

Filed Dec. 19, 1990, Ser. No. 631,100

Int. Cl.[5] A47B *3/00*

U.S. Cl. 108—129 **4 Claims**



1. Folding furniture comprising four panels hinged together to form a rectangular structure; the said four panels serving as top, bottom, and side panels of the rectangular structure; adjoining panels at two diagonally opposed corners of the rectangular structure, having axially aligned bores, in a tongue and groove assembly, receiving pins to secure the adjoining panels, allowing said panels to swing obtusely; panels meeting at the other two diagonally opposed corners of the rectangular structure being attached with hinges, allowing said panels to swing acutely; said side panels of the rectangular structure containing support members hinged to said side panels and pivotal from the plane of said side panels toward the interior of rectangular structure to rest against a panel adjacent to said side panels to support the overall structure in an erected position.

5,069,145

PLASTIC REFUSE DISPOSAL SYSTEM

William M. Croke, Huntington Beach, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 5, 1990, Ser. No. 622,876

Int. Cl.[5] F23G *5/00, 7/00*

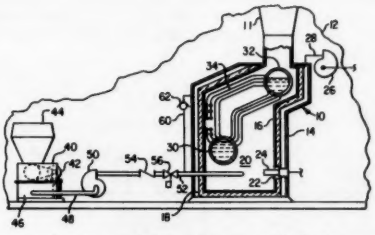
U.S. Cl. 110—244 **5 Claims**

1. A system for shipboard use in disposing of plastic material and the like by reducing the material to particulates which may be incinerated, said system comprising:

a granulator apparatus for reducing plastic material and the like to granular particulates;

pneumatic conveyor means for conveying said particulates to a discharge conduit, said discharge conduit being connected for discharging said particulates to the interior of a boiler;

a marine boiler, including a fire box space for combustion of a fuel to generate steam and means defining a forced draft combustion air flow space, said discharge conduit being arranged such as to discharge said particulates into said fire box space for incineration to dispose of said material; and



a scavenging air conduit opening into said discharge conduit for conducting air into said discharge conduit to scavenge particulates from said discharge conduit generally at a point of penetration of said discharge conduit into said boiler, said scavenging air conduit being in communication with said combustion air flow space for conducting forced draft combustion air to said discharge conduit from said combustion air flow space.

5,069,146

GRATE FOR A FUEL BOILER

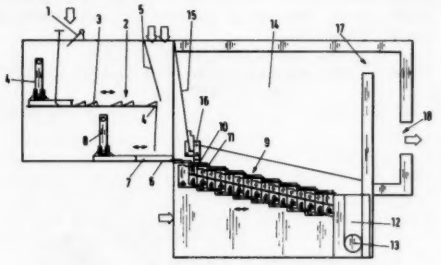
Louis Dethier, Waimes, Belgium, assignor to Teset A.G., Waimes, Belgium

Filed Jan. 10, 1991, Ser. No. 638,904

Claims priority, application Fed. Rep. of Germany, Jan. 16, 1990, 4000973

Int. Cl.[5] F23H *7/08, 7/14*

U.S. Cl. 110—281 **19 Claims**



1. A grate for a fuel boiler having first and second ends and comprising:

a first holder;

a second holder;

a plurality of plates arranged in a cascading fashion, said plurality of plates comprising at least two plates fixedly attached to said first holder and a third movable plate attached to said second holder and disposed between said two fixed plates, said third plate being capable of reciprocating between said fixed plates;

drive means attached to said second holder for driving said third plate to reciprocate; and

wherein said first and second fixed plates are vertically adjustable with respect to said first holder, and said third

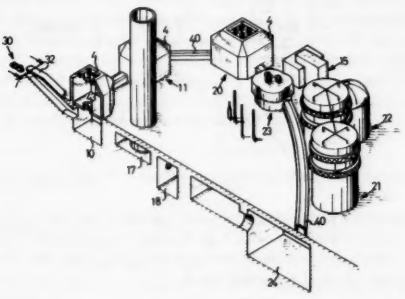
movable plate is vertically adjustable with respect to said second holder.

5,069,147

TOURING SYSTEM FOR A WASTE PROCESSING PLANT

Palatan L. J. Tan, 2 Fl., No. 23, Syh Chuan Rd., Taichung, Taiwan; David Tan, and Richard Tan, both of 34-25 150 Place #3B, Flushing, N.Y. 11354

Filed May 3, 1990, Ser. No. 519,516
Int. Cl.[5] F23B *7/00*
U.S. Cl. 110—349 **5 Claims**



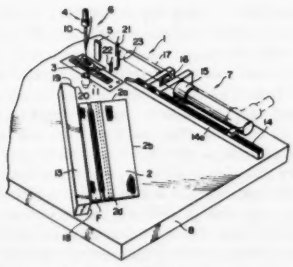
1. A touring system for a waste processing plant, said waste processing plant comprising a plurality of processing stations, including a reception station; said touring system comprising a housing provided upon each said station, a transparent device being provided in an opening which is formed in a floor of each said housing, said housing being separated from said processing station by said floor and said transparent device; a passage being connected between every two adjacent housings; an approach which is substantially enclosed being connected to said reception station; and people may observe a processing or a treatment of a waste in said housing without feeling disgus, and may realize how said waste is reusable.

5,069,148

TROUSER-FLY PIECE SERGING APPARATUS

Kiichirou Ishikawa; Yasuhiro Fukumoto, and Chet Dudek, all of Marietta, Ga., assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Sep. 7, 1990, Ser. No. 578,669
Int. Cl.[5] D05B *3/12, 3/22, 37/00*
U.S. Cl. 112—104 **9 Claims**



1. An apparatus for trimming at least a corner of a leading end of an elongate rectangular trouser-fly piece along a substantially arcuate trimming line and substantially at the same time for forming a serge stitching on one longitudinal edge of the trouser-fly piece including the trimmed arcuate corner, said apparatus comprising:

a serging unit defining a serging station for advancing the elongate rectangular trouser-fly piece longitudinally along a path to move through the serging station and for serging one curved longitudinal edge of the trouser-fly piece with the serge stitching during advancing;

a trimming cutter disposed immediately upstream of said serging station and operative in synchronism with said serging unit for trimming at least a corner of the leading edge of the trouser-fly piece along the substantially arcuate trimming line to form the curved longitudinal edge including the trimmed arcuate corner while the trouser-fly piece is being advanced by said serging unit;

a first guide member disposed upstream of said trimming cutter and having a first guide surface extending at such an angle relative to said path of advancement of the trouser-fly piece that the first guide surface and the path of advancement of the trouser-fly piece converge toward the serging station for guiding the trouser fly-piece into said serging station so that said trimming cutter assumes a position to conform to a curvature of the leading end of said arcuate trimming line; and

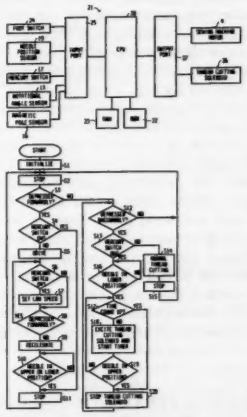
a second guide member disposed upstream of said trimming cutter and having a second guide surface extending parallel to said path of advancement of the trouser-fly piece for guiding said curved longitudinal edge of the trouser-fly piece except said trimmed arcuate corner after the trouser-fly piece is guided into said serging station by said first guide member.

5,069,149

MOTOR DRIVING DEVICE FOR SEWING MACHINE

Yoshiharu Higuchi, Yokkaichi, and Kazuhisa Ito, Aichi, both of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed May 16, 1991, Ser. No. 701,092
Claims priority, application Japan, Aug. 9, 1990, 2-212667
Int. Cl.[5] D05B *69/36*
U.S. Cl. 112—277 **13 Claims**



6. A sewing machine comprising:

a machine frame;

a machine motor;

driving means for starting and driving the machine motor;

detecting means for detecting tilt of the machine frame with respect to a horizontal posture where a sewing operation is performed; and

control means for inhibiting the driving means from starting the machine motor in a first detection state where the detecting means detects the tilt of the machine frame while the machine motor driving means is inoperative and for permitting the driving means to continue driving the

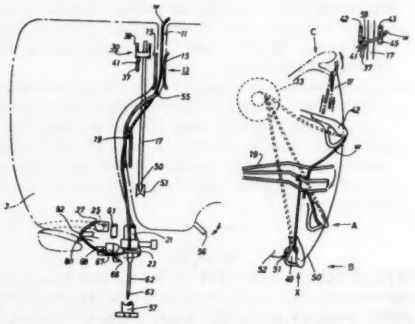
machine motor in a second detection state where the detecting means detects the tilt of the machine frame while the machine motor driving means is operative.

5,069,150

SEWING MACHINE FOR AUTOMATIC THREAD TAKING-UP OPERATION

Masao Ogawa, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Oct. 9, 1990, Ser. No. 594,038
Claims priority, application Japan, Oct. 13, 1989, 1-266677
Int. Cl.[5] D05B *49/00*
U.S. Cl. 112—241 **20 Claims**



17. In a sewing machine having a sewing head carrying a needle bar driven by a sewing motor and having a sewing needle with an eye therethrough mounted on a bottom end for motion therewith, automatic thread taking-up apparatus comprising:

a) a thread taking-up member provided at one end of a thread guide;

b) a thread holding member carried by an outer end of an arm in a swinging operation of said arm about an inner end thereof, said thread holding member comprising a projecting member projecting beyond said outer end of said arm, said thread holding member comprising a downward-facing claw carried by said an outer end of said arm, said claw including a lower J-shaped hook for holding thread, a pathway formed in said thread holding member through which a portion of a needle thread enters said thread holding member, and an upper cover comprising a blocking member for preventing said portion of said needle thread once having entered said thread holding member through said pathway from slipping back out of said thread holding member through said pathway; and,

c) needle thread carrying means for introducing a needle thread into said thread holding member when said thread holding member swings toward an opposite end of said thread guide and a portion of said needle thread intersecting said thread guide abuts said projecting member.

5,069,151

METHOD AND APPARATUS FOR DETECTING SKIPPED STITCHES FOR A LOCKSTITCH SEWING MACHINE

Stephen L. Bellio, West Roxbury, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Jul. 5, 1990, Ser. No. 548,111
Int. Cl.[5] D05B *69/36*
U.S. Cl. 112—278 **6 Claims**

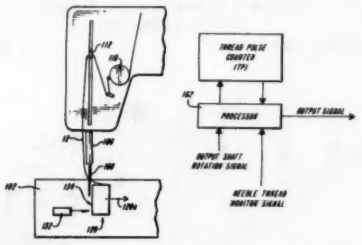
1. Apparatus for detecting a skipped stitch for a Class 301 lockstitch sewing machine, said machine including:

an axially reciprocal needle adapted to incorporate at least one needle thread into a succession of Class 301 lockstitches;

a drive motor having an output shaft and associated means for driving said needle through at least one reciprocal motion per stitch, said output shaft being rotatable through one full rotation per stitch; and

a rotatable bobbin assembly including means for incorporating a bobbin thread into said lockstitches; comprising:

means for detecting passage of said needle thread across a face of said bobbin assembly:



means for detecting each full rotation of said output shaft; and

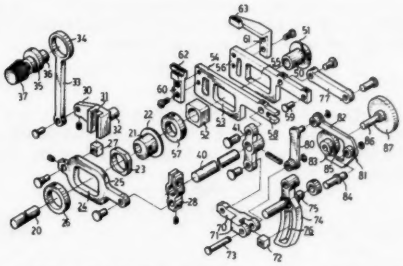
means for identifying times corresponding to rotation of said output shaft for which no passage of said needle thread about said bobbin assembly is detected, said times being indicative of a skipped stitch.

5,069,152

DIFFERENTIAL FEEDING APPARATUS FOR A SEWING MACHINE

Shui-Nu Wang, No. 6, Nan Pin Road, Taichung, Taiwan

Filed Feb. 12, 1991, Ser. No. 654,244
Int. Cl.[5] D05B *27/08*
U.S. Cl. 112—313 **5 Claims**



1. A differential feeding apparatus for a sewing machine which has a base for accommodating said differential feeding apparatus, said differential feeding apparatus comprising: a spindle and a shaft rotatably supported in parallel in said base, a middle portion of a first lever being fixed on one end of said shaft, one end of said first lever being coupled to said spindle by a coupling means so that said first lever can be caused to swing by said spindle, a middle portion of a second lever being fixed on the other end of said shaft; a first cam fixed on one end of said spindle and engaged in a first guide which has a square outer shape, said first guide being slidably received in first rectangular openings of a first follower and a second follower so that said first follower and said second follower are caused to move up and down by said first cam; a first pawl being fixed on one end of said first follower, and a second pawl being fixed on one end of said second follower and being aligned with said first pawl; the other end of said first follower being pivotally coupled to one end of said second lever so that said first follower is caused to move back and forth by swinging movement of said second lever; one end of a first link being pivotally coupled to the other end of said second lever, a fork being

integrally formed on the other end of said first link, a first block being pivotally coupled between a pair of limbs of said fork by a first pin; a middle portion of a third lever being pivotally supported on a first axle, a groove being formed in a lower portion of said third lever for slidably receiving said first block; an upper end of said third lever being pivotally coupled to the other end of said second follower so that said second follower can be caused to move back and forth by swinging movement of said third lever; a third follower being pivotally supported in said base of said sewing machine and having a leg pivotally coupled to said first pin, a second cam being engaged with said third follower for causing said third follower to move up and down so that said first block can be caused to move up and down along said groove of said third lever, when said first block moves up and down along said groove of said third lever, a distance between said first block and said first axle can be changed and so that an amplitude of said upper end of said third lever can be adjusted, and so that said first pawl can move back and forth relative to said second pawl.

5,069,153

HARNESS

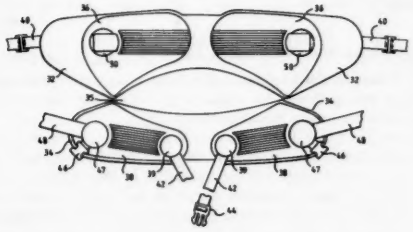
Reinhard Pascher, Salzburg, Austria, assignor to Neil Pryde Limited, Hong Kong

Filed Jun. 27, 1990, Ser. No. 545,515

Claims priority, application United Kingdom, Jun. 30, 1989, 8915066

Int. Cl.[5] B63B *35/79*

U.S. Cl. 114—39.2 **2 Claims**



1. A harness for boardsailing, the harness comprising two first panels of flexible material which fit laterally across the body of a boardsailor separated and connected together by a web, a pair of substantially rigid panels laterally separated and secured to each first panel, two boom straps extending respectively between the two first panels and swivably connected at each end to one of each pair of rigid panels.

5,069,154

MARINE SAFETY SYSTEM FOR POSITIVE-PRESSURE ENGINES

John A. Carter, P.O. Box 35522, Monte Sereno, Calif. 95030

Continuation-in-part of Ser. No. 385,772, Jul. 26, 1989, Pat. No. 4,944,241. This application Jul. 27, 1990, Ser. No. 558,646

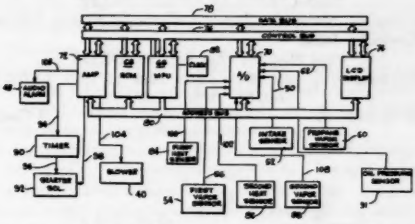
Int. Cl.[5] B63J *2/06*

U.S. Cl. 114—211 **10 Claims**

1. A safety system for ventilation of a marine engine compartment having a ventilating device for exhausting gas therefrom, said compartment housing a marine engine, said safety system comprising,

means operatively connected to said marine engine for sensing a specified engine pressure, said sensing means having an input and having an output, and

control means operatively connected to said output for activating and deactivating said marine ventilating device in response to outputs from said sensing means, said control means activating said ventilating device upon detection of said specified engine pressure entering a preselected range of pressure.



5,069,155

APPARATUS FOR IN-LINE LACQUERING OF COMPACT DISKS

Horst Kunze-Concewitz, Wiernsheim, and Roland Zaiss, Niefern, both of Fed. Rep. of Germany, assignors to Convac GmbH, Fed. Rep. of Germany

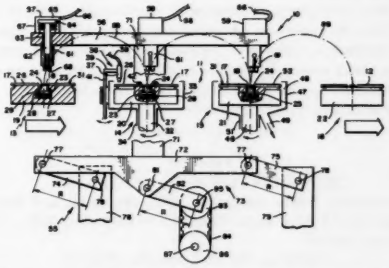
PCT No. PCT/EP88/00858, § 371 Date May 23, 1989, § 102(e) Date May 23, 1989, PCT Pub. No. WO89/02819, PCT Pub. Date Apr. 6, 1989

PCT Filed Sep. 22, 1988, Ser. No. 358,355

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1987, 3732113

Int. Cl.[5] B05C *1/02, 5/00*

U.S. Cl. 118—52 **11 Claims**



1. An apparatus for the in-line lacquering of compact disks, comprising:

a process apparatus including a loading means at which a compact disk is received and centered, a lacquer metering means at which a compact disk is received from the loading means and centered and a lacquer bead applied to the top surface of the compact disk, a lacquer bead centrifuging means at which the compact disk with a lacquer bead is received from the lacquer metering means, centered and rotated, and the lacquer bead uniformly distributed over the top surface of the compact disk by centrifugal force, an unloading means at which a compact disk is received from the lacquer bead centrifuging means and centered for rotating the compact disk at least the lacquer bead, wherein said means are spaced apart by the same distance; and

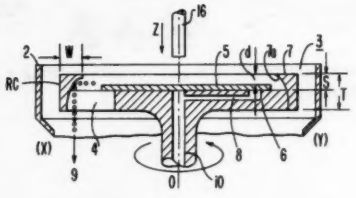
a manipulator including at least one gripper for moving compact disks in harmonic fashion between adjacent ones of said loading means, lacquer metering means, lacquer bead centrifuging means and unloading means.

5,069,156

SPIN COATING APPARATUS FOR FORMING A PHOTORESIST FILM OVER A SUBSTRATE HAVING A NON-CIRCULAR OUTER SHAPE

Eiji Suzuki, Mizusawa, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 13, 1990, Ser. No. 492,126
Claims priority, application Japan, Mar. 22, 1989, 1-070076
Int. Cl.[5] B05C *11/08*
U.S. Cl. 118—52 **9 Claims**



9. A spin coating apparatus for coating photoresist material over a substrate, said apparatus comprising:

dispensing means for applying said photoresist material to said substrate;

a cup member;

a turntable rotatably driven inside said cup member, said turntable including:

a supporting disk member having a plurality of openings in the peripheral portion thereof to allow the excess of said photoresist material to be drained therethrough and being capable of holding said substrate thereon by vacuum chucking, and

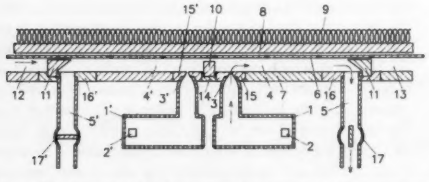
an annular member fixed on said peripheral portion of said supporting disk member, said annular member having an imperforate inner circular wall with a surface of revolution, said inner circular wall overhanging toward the inside to cause said photoresist material splashing against said inner circular wall to drain downwardly, said annular member having a height so that said substrate held on said supporting disk member does not protrude from the top end of said annular member.

5,069,157

THIN FILM FORMING APPARATUS

Mizuho Imai; Mikio Sekiguchi; Nobuyasu Shiba, and Hideyo Iida, all of Tokyo, Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1990, Ser. No. 573,235
Claims priority, application Japan, Aug. 31, 1989, 1-224981
Int. Cl.[5] B05B *1/34;* B05C *5/00*
U.S. Cl. 118—314 **5 Claims**



3. A thin film forming apparatus for forming a thin film on a surface of a plurality of substrates said apparatus comprising:

at least one atomizer for atomizing a source solution;

a film forming chamber provided above said at least one atomizer;

a nozzle provided on an upper portion of each said at least one atomizer, said nozzle(s) being connected to and opening into said film forming chamber so as to be able to introduce atomized source solution therein;

intake and exhaust ducts connected to the film forming chamber respectively at positions on opposite sides of said nozzle(s), said intake and exhaust ducts having flow regulating means provided therein;

substrate feeding means for feeding said substrates into said film forming chamber in such a manner that said surface of said substrates form the ceiling of said film forming chamber; and

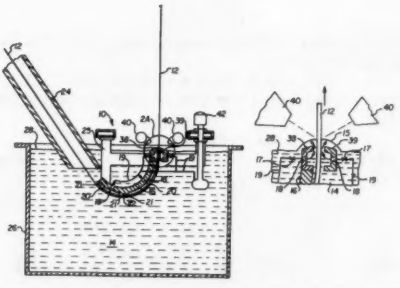
heating means for heating the substrate.

5,069,158

HYDROSTATIC BEARING SUPPORT OF STRIP

Giorgio A. Rey, Wexford, Pa., assignor to Italimpianti of America, Inc., Coraopolis, Pa.

Division of Ser. No. 499,796, Mar. 27, 1990, Pat. No. 5,015,509.
This application Oct. 31, 1990, Ser. No. 606,538
Int. Cl.[5] B05C *3/15*
U.S. Cl. 118—410 **10 Claims**



1. A strip treating apparatus for supporting a strip conveyed along a feed path and for contacting both face surfaces of the strip with treatment liquid comprising:

(a) at least one hydrostatic chute having a surface along which the strip is drawn thereby establishing said feed path, said surface having a plurality of chambers confined therein, said chambers enclosed by ridges raised outwardly from said surface over the longitudinal length and transverse width thereof and said chambers having apertures therein for supply of a pressurized treatment liquid into each chamber;

(b) a container for holding a bath of said treatment liquid arranged so that said at least one hydrostatic chute is submerged below the surface of the bath; and

(c) means for supplying said pressurized treatment liquid to said apertures and said chambers such that said treatment liquid is flowably restrained within said chambers to maintain said strip spaced from said at least one hydrostatic chute by a hydrostatic force of said pressurized liquid acting upon the strip face surface as the strip is conveyed across said at least one hydrostatic chute.

5,069,159

MILK HOSE SUPPORT

Steve N. Peacock, 2204 Anthony Dr., Anthony, N. Mex. 88021

Filed Aug. 9, 1990, Ser. No. 565,030
Int. Cl.[5] A01J *7/00*
U.S. Cl. 119—14.1 **4 Claims**

1. A device for supporting a milking hose on a dairy stall curb during milking operations, comprising

a base,

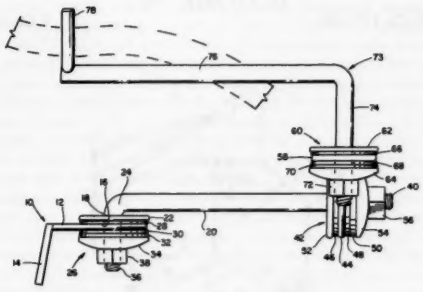
means for connecting the base to the curb,

a first arm connected to the base by a first friction pivot permitting the arm to rotate about a single first axis, said pivot supporting one end of the first arm,

a knuckle connected to the other end of the first arm, said

knuckle comprising a second pivot and a third pivot connected at right angles, and

a second arm having a first end supported by said knuckle,



and a second end having thereon a fork for supporting the milking hose,

whereby the position of the hose supporting means can be adjusted in at least two directions with respect to the base.

5,069,160

AUTOMATIC MILKING OF ANIMALS

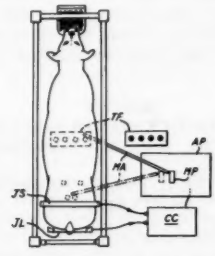
Michael J. Street, Bedford; John A. Benson, Wootton; John A. Marchant, Bedford; Arthur L. Wilkin, Hitchin, and Clive J. Allen, Bracknell, all of England, assignors to National Research Development Corporation, London, England

Filed Jan. 3, 1990, Ser. No. 462,530

Claims priority, application United Kingdom, Jan. 4, 1989, 8900084

Int. Cl.[5] A01J *7/00*

U.S. Cl. 119—14.08 **15 Claims**



1. An arrangement to apply a milking apparatus to the udder of an animal at a milking point including:

a milking apparatus store,

a handling device having an elongated arm to support and move the apparatus between an apparatus acquisition point and the milking point,

means to define a specific space for an animal to be milked fixedly related to the acquisition point and the milking point,

means to retain loosely in said space an animal to be milked,

means to sense retained animal position with respect to the fixedly related space and points and provide a first control signal indicative of sensed animal position,

a device base mechanically distinct from said means to retain loosely an animal,

means to support the elongate arm on said base for swinging and longitudinal displacement,

pneumatic means in said device to swing and to longitudinally displace said elongate arm about said base to acquire milking apparatus from said store and to move and position said elongate arm and any supported apparatus, and

control means to control said pneumatic means to operate said arm to acquire milking apparatus at a position forward of the teats of a retained animal,

said control means being responsive to said first control signal to move said acquired apparatus rearwardly and under the animal to said milking point for application to a respective teat of a retained animal,

the arrangement further including in association with said acquired apparatus localized teat sensing means to provide a second control signal indicative of sensed teat position relative to said acquired apparatus,

the control means being responsive also to said second control signal to control said pneumatic means for application of said acquired apparatus to a respective teat,

the movement of the arm by the response of said control means to the second control signal being localized with respect to the response to the first control signal to enable a teat cup of said apparatus to be applied to a teat.

5,069,161

TEAT CATCHER FOR A MILKING MACHINE AND A PROCESS FOR MILKING BY USING SUCH A TEAT CATCHER

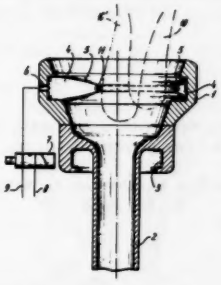
Anne Pera, Emmeloord, Netherlands, assignor to Gascoigne-Melotte B.V., Emmeloord, Netherlands

Continuation of Ser. No. 365,871, Jun. 14, 1989, abandoned. This application Mar. 26, 1991, Ser. No. 675,302

Claims priority, application Netherlands, Jun. 15, 1988, 8801526

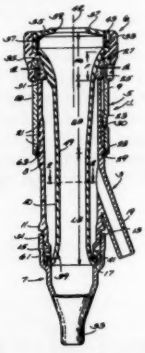
Int. Cl.[5] A01J *5/04*

U.S. Cl. 119—14.47 **19 Claims**



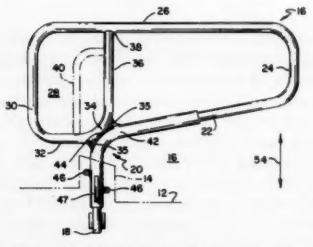
1. A teat catcher connected in sealing fashion to a teat cup for a milking machine placed underneath said teat catcher, said teat catcher being wider than said teat cup, said teat cup having a lining therein, said teat catcher comprising an annular flexible element, said annular flexible element provided separate from said teat cup and situated above and at a distance from an upper edge of said lining in said teat cup; means provided in said annular flexible element for giving said annular flexible element a large opening while a teat of an animal being milked is accommodated in said teat catcher, wherein said annular flexible element having a large opening is folded against the interior of said teat catcher; and means provided in said annular flexible element for reducing the diameter of said annular flexible element to a diameter of 60% or less of the original diameter of said annular flexible element after said teat is accommodated inside said opening, wherein a smaller central opening is formed in said annular flexible element directly above said teat cup lining and said annular flexible element having a smaller central opening forms a wall generally transverse to the axis of said teat cup.

5,069,162
TEAT CUP INFLATION
Paul D. Thompson, and Gary C. Steingraber, both of Madison, Wis., assignors to DEC International, Inc., Madison, Wis.
Filed May 23, 1990, Ser. No. 527,614
Int. Cl.[5] A01J 5/00
U.S. Cl. 119—14.47 18 Claims



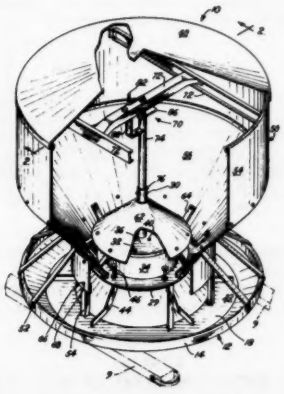
1. An inflation comprising a flexible generally tubular member having a longitudinal axis and a wall with first and second ends, the tubular member having a lower barrel adjacent the first end, a mouthpiece chamber adjacent the second end, and an upper barrel intermediate the lower barrel and the mouthpiece chamber, the wall of the tubular member upper and lower barrels being formed as a continuous band of alternating exterior and interior flutes, the exterior flutes lying within an envelope of predetermined diameter, a predetermined length of the wall of the tubular member mouthpiece chamber having flutes on the interior surface thereof.

5,069,163
TIE STALL DIVIDER
Joseph R. Moreau, New Hartford, and John J. Dyer, Westmoreland, both of N.Y., assignors to Norbco, Inc., Westmoreland, N.Y.
Filed Nov. 14, 1990, Ser. No. 612,619
Int. Cl.[5] A01K 1/00
U.S. Cl. 119—27 24 Claims



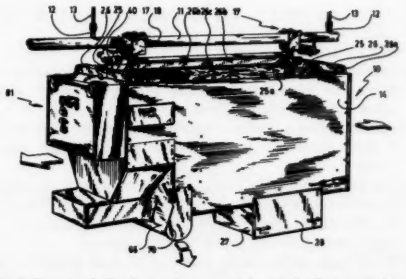
1. A tie stall divider for dividing a row of animal stalls to define the animal stalls on either side of the divider, the divider being formed of a single continuous main rail that is bent into a sequence of bent and straight rail portions that lie in a generally vertical plane; said bent and straight rail portions including a single generally vertical support post that is anchored in a curb, and a first bend joining a top end of the support post to a next successive one of said rail portions, the tie stall divider being supported only by said single support post.

5,069,164
ANIMAL FEEDER
Mark A. Wiwi, South Bend, Ind., assignor to Universal Cooperatives, Inc., Minneapolis, Minn.
Filed Feb. 6, 1990, Ser. No. 475,956
Int. Cl.[5] A01K 5/00
U.S. Cl. 119—53 5 Claims



1. An animal feeder including a hopper for storing feed and defining a feed discharge opening, said hopper further including a base defining a feed receiving trough positioned beneath the hopper, a feed plate rotatably supported above said base and below said discharge opening, said feed plate supporting a portion of animal feed stored within said hopper wherein feed flows from said hopper through said discharge opening onto said feed plate and from said plate into said trough, and a deflector means positioned above said plate for substantially supporting the weight of feed within the hopper, the improvement comprising a spacer means carried adjacent said feed plate beneath said deflector means, said spacer means for limiting the quantity of feed carried by said plate.

5,069,165
LIVESTOCK FEEDER SYSTEM
Victor Rousseau, 700, Route 259, Sainte-Monique, Quebec, Canada J0G 1N0
Filed Oct. 12, 1990, Ser. No. 596,505
Int. Cl.[5] A01K 5/02
U.S. Cl. 119—57.6 14 Claims



10. A livestock feeder unit comprising a feeder container, a mobile support for said container carrying said container along a series of livestock positions, a weighing scale interconnecting said feeder container and said support for weighing said container and its contents, said container composed of a main compartment for containing fibrous feed and of several secondary compartments disposed side by side and for containing

different granula feeds, a discharge trough with which the bottom portions of all compartments communicate, a main discharge power-operated conveyor screw in said trough, secondary power-operated conveyor screws located in the bottom portions of said secondary compartments and disposed normal to said trough and to said main discharge conveyor screw for discharging granular feeds from said respective secondary compartments in to said transverse trough, power-operated fibrous feed shredders in said main compartment and a power-operated endless conveyor in the bottom portion of said main compartment for discharging fibrous feed from said main compartment into said transverse trough, and a programmable control unit carried by said feeder unit and controlling the number of turns of each secondary conveyor screw and, responsive to an indication from said weighing scale, the operating time of said endless conveyor and of said main discharge conveyor screw, said control unit causing concurrent operations of said main and secondary conveyor screws and of said shredders and endless conveyor, so as to mix the granular feeds with the fibrous feed before discharge of the resulting mixture from the feeder unit.

5,069,166

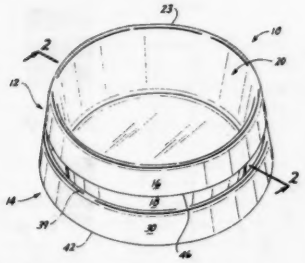
PET DISH

Stephen K. Ahuna, 25101 Via Portola, Laguna Hills, Calif. 92677

Continuation-in-part of Ser. No. 347,326, May 4, 1989, abandoned. This application Sep. 15, 1989, Ser. No. 518,698

Int. Cl.[5] A01K *5/00*

U.S. Cl. 119—61 **20 Claims**



1. An animal dish comprising:

a receptacle with at least one top opening and defining a container for food or drink for an animal;

an angularly positioned first end portion extending outwardly and downwardly relative to said top opening of said receptacle and terminating in a first end surface; and

a base member secured to said receptacle and together with said receptacle defining an annular moat surrounding said receptacle, said moat being sized, adapted and located to be filled with water to inhibit crawling insects from having access to the food or drink in said container, said base member having a top rim located below said first end surface and a portion of said container being located below said top rim.

5,069,167

PET FOOD CONTAINER

Leslie L. Kasselman, 11550 Sage Canyon, Houston, Tex. 77089

Filed Nov. 8, 1990, Ser. No. 610,577

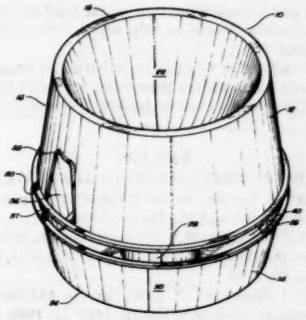
Int. Cl.[5] A01K *5/01*

U.S. Cl. 119—61 **14 Claims**

1. A pet food container comprising:

a dish member having an outwardly angled side wall, said dish member having a concavity formed at an upper surface, said dish member having a connector formed on a bottom surface on said concavity; and

a base member having a generally flat bottom surface, said base member having a raised rim extending outwardly from an outer periphery of said bottom surface, said base member having a central member for engaging said connector of said dish member, said rim and said central member defining a liquid-receiving moat in said base member, said dish member positioned above said base member such that said angled side wall of said dish member is separated from said rim of said base member, said



angled side wall having a window area formed therein, said window area for allowing a liquid to be passed to said moat of said base member, said window area having a thin strip extending along a bottom edge of said angled side wall, said window area having a ledge formed along a top edge of said window area, said ledge for deflecting material from entering said window area.

5,069,168

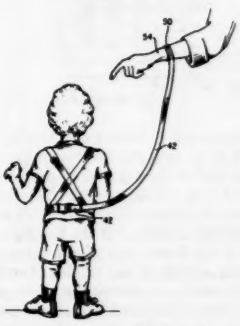
CHILD'S SAFETY HARNESS

Linda K. Roberson, P.O. Box 1518, Canler, N.C. 28715, and Suzanne Mackey, 3 S. Pine Island Rd., Apt. 209B, Plantation, Fla. 33324

Filed Dec. 13, 1990, Ser. No. 627,193

Int. Cl.[5] A01K *29/00*

U.S. Cl. 119—96 **15 Claims**



1. A safety harness for a child comprising a unified vest harness including a front vest, a pair of criss-crossing back straps, a waist belt, a tether belt and an adjustable means,

the front vest adapted to cover the upper front torso of the child,

the back straps adapted to fit over the back of the child in a criss-crossing fashion from top to bottom and be permanently secured to the top of the front vest and at the bottom to the waist belt, the waist belt adapted to encircle the front and back torso of the child, and having the front encircling portion of the waist belt permanently secured to the bottom of the front vest, and having one end of the

back encircling portion of the waist belt adjustably positioned along the waist belt and secured by the adjustable means,

the other end of said back encircling portion extends beyond said harness to form a tether belt and adapted to terminate around a person's wrist or to be releasably secured around the waist belt,

the adjustable means allows the waist belt to be varied in size which varies the length of the tether belt at the back of the child,

whereby said harness is put on over the head and secured by said adjustable means to help support the child's upper torso, and

whereby said tether belt can be worn either encircling the waist belt and attached thereon or exceeded freely from the adjustable means to be held by a person.

5,069,169

TUBE-IN-SHELL HEATING APPARATUS

Saburo Maruko, Yamato, Japan, assignor to Nippon Chemical Plant Consultant Co., Ltd., Tokyo, Japan

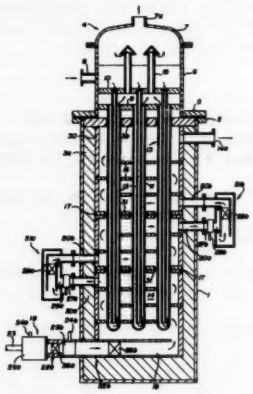
PCT No. PCT/JP90/00408, § 371 Date Nov. 26, 1990, § 102(e) Date Nov. 26, 1990, PCT Pub. No. WO90/11473, PCT Pub. Date Apr. 10, 1990

PCT Filed Mar. 27, 1990, Ser. No. 613,736

Claims priority, application Japan, Mar. 27, 1989, 1-71862

Int. Cl.[5] F22B *1/02*

U.S. Cl. 122—33 **9 Claims**



1. A heating apparatus consisting of a heating chamber with a bottom having an opening portion in an upper part thereof, a cover body provided at the top portion of said heating chamber, a plurality of heat-exchanger pipe bodies inserted along a vertical direction at predetermined intervals in said heating chamber in diametral directions of the heating chamber, a can plate provided in the lower part of said cover body so as to block the opening portion of said heating chamber and also to support said pipe bodies, a plurality of sheets of baffle plates arranged so as to form a labyrinth stretching vertically in a row in said heating chamber and having said pipe bodies penetrate therethrough, a combustion gas inflow port provided at a bottom portion of the heating chamber on a sidewall adjacent to said bottom portion and having an opening portion at the bottom portion of said heating chamber and an exhaust gas outflow port provided in an upper part of said heating chamber on a sidewall adjacent to said upper part and having an opening portion in the upper part of said heating chamber, comprising:

a main catalytic combustion equipment located outside of said heating chamber and connected to said combustion gas inflow port;

a plurality of partition plates provided in said heating chamber so as to partition said labyrinth into a plurality of chambers vertically; and

a plurality of auxiliary catalytic combustion equipments provided so as to connect said chambers on the lower side and the upper side of respective partition plates.

5,069,170

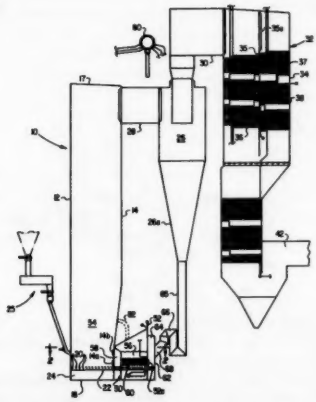
FLUIDIZED BED COMBUSTION SYSTEM AND METHOD HAVING AN INTEGRAL RECYCLE HEAT EXCHANGER WITH INLET AND OUTLET CHAMBERS

Walter P. Gorzegno, Morristown; Iqbal F. Abdulally, Randolph; John W. Phalen, Somerville, and Alfred S. Touma, West Caldwell, all of N.J., assignors to Foster Wheeler Energy Corporation, Clinton, N.J.

Filed Mar. 1, 1990, Ser. No. 486,652

Int. Cl.[5] B09B *3/00*; F22B *1/00*

U.S. Cl. 122—4 D **35 Claims**



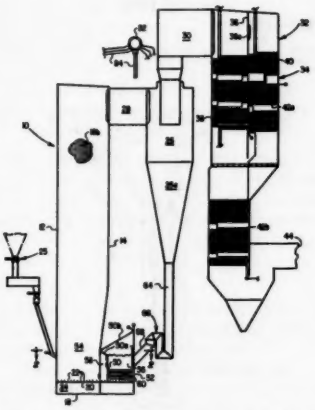
1. A fluidized bed combustion system comprising an enclosure; means defining a furnace section and a recycle heat exchange section in said enclosure; a fluidized bed formed in each of said sections; a separating section for receiving a mixture of flue gases and entrained particulate material from the fluidized bed in said furnace section and separating said entrained particulate material from said flue gases; a heat recovery section for receiving said separated flue gases; means for passing said separated material from said separating section to said recycle heat exchange section; means for dividing said recycle heat exchange section into an inlet chamber for receiving said separated material from said passing means, an outlet chamber, a bypass compartment extending between said chambers, and an additional compartment extending between said chambers; heat exchange means disposed in said additional compartment for removing heat from said separated material; means for selectively directing said separated material from said inlet chamber, through said additional compartment to said outlet chamber or from said inlet chamber, through said bypass compartment to said outlet chamber and means connecting said outlet chamber to said furnace section for passing said separated material to said furnace section.

5,069,171

FLUIDIZED BED COMBUSTION SYSTEM AND METHOD HAVING AN INTEGRAL RECYCLE HEAT EXCHANGER WITH A TRANSVERSE OUTLET CHAMBER

Arthur M. Hansen, East Hanover; William D. Stevens, North Caldwell, and Justin P. Winkin, Annandale, all of N.J., assignors to Foster Wheeler Agency Corporation, Clinton, N.J.

Filed Jun. 12, 1990, Ser. No. 537,396
Int. Cl.[5] F22B *1/02*
U.S. Cl. 122—4 D 16 Claims



1. A fluidized bed combustion system comprising an enclosure; means defining a furnace section and a recycle heat exchange section in said enclosure; a fluidized bed formed in each of said sections; a separating section for receiving a mixture of flue gases and entrained particulate material from the fluidized bed in said furnace section and separating said entrained particulate material from said flue gases; a heat recovery section for receiving said separated flue gases; means for passing said separated material from said separating section to said recycle heat exchange section; means for dividing said recycle heat exchange section into a bypass compartment for directly receiving said separated material from said passing means, an outlet chamber, and an additional compartment, heat exchange means disposed in said additional compartment for removing heat from said separated material, means for selectively directing said separated material from said bypass compartment through said additional compartment to said outlet chamber or from said bypass compartment directly to said outlet chamber; and means connecting said outlet chamber to said furnace section for passing said separated material to said furnace section.

5,069,172

NUCLEAR STEAM GENERATOR SLUDGE LANCE METHOD AND APPARATUS

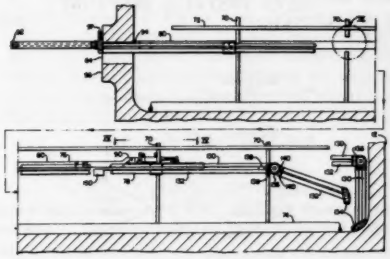
Ray A. Shirey, New Stanton, and David E. Murray, Greensburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 26, 1990, Ser. No. 590,078
Int. Cl.[5] F22B *37/54*; F28G *9/00, 15/00*
U.S. Cl. 122—382 31 Claims

1. A sludge lancing system for removing sludge deposits from an interior region of a steam generator comprising:

a peripheral fluid injection means for injecting a fluid at a high pressure about a periphery of the steam generator, said peripheral fluid injection means comprising at least one elongated fluid conduit, at least one injection nozzle and a joint positioned at a predetermined point along said elongated fluid conduit for permitting said peripheral fluid injection means to bend to a predetermined angle at said joint within the steam generator;

a reciprocable fluid injection means for injecting a fluid at a high pressure toward the sludge deposits and dislodging the sludge deposits; and



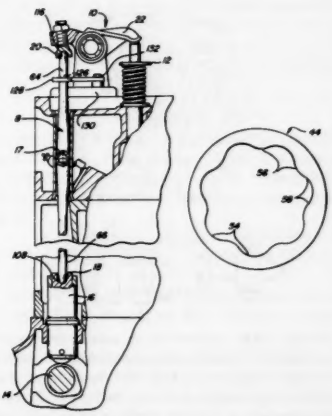
a supporting means positioned within the interior of the steam generator for supporting said reciprocable fluid injection means throughout the reciprocation of said reciprocable fluid injection means.

5,069,173

PUSH ROD HAVING IRREGULARLY SHAPED INTERNAL BORE

Angelos Mallas, Mt. Clemens, Mich., assignor to MALL Tooling and Engineering, Mt. Clemens, Mich.

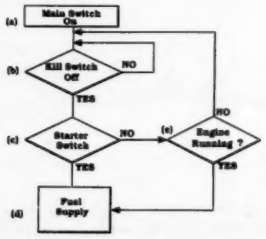
Continuation-in-part of Ser. No. 446,302, Dec. 5, 1989, Pat. No. 5,027,763. This application Apr. 3, 1991, Ser. No. 679,743
Int. Cl.[5] F01L *1/14*
U.S. Cl. 123—90.61 13 Claims



1. A push rod for an internal combustion engine comprising:

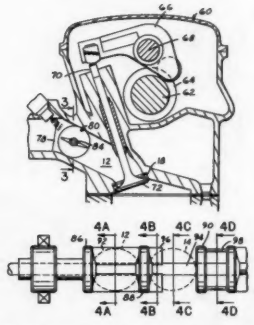
an elongated one piece hollow metal tube having radiused bearing surfaces located at the outer tips thereof, said tube having a single, generally concentric inner bore extending throughout the longitudinal length thereof, said bore having an irregularly shaped cross section being defined by alternately connected convex and concave portions, said convex portions being located diametrically opposite of said concave portions, and said tube having a substantially circular outer circumference.

5,069,174
FUEL SUPPLYING DEVICE FOR MARINE PROPULSION ENGINE
Isao Kanno, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan
Filed Mar. 30, 1990, Ser. No. 502,544
Claims priority, application Japan, Mar. 30, 1989, 1-78903
Int. Cl.[5] F02D *43/00*; F02N *11/08*
U.S. Cl. 123—179.16 **9 Claims**



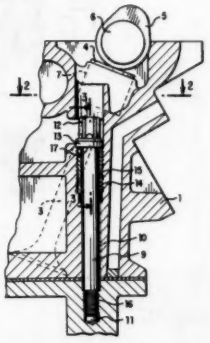
1. In an engine having a starter for cranking said engine for starting, a fuel supply system for supplying fuel to said engine for its running, an ignition system and a kill switch for stopping said engine by disabling said ignition system, the improvement comprising means for precluding the discharge of fuel from said fuel supply system when said starter is operated and said kill switch is in the engine stopping position.

5,069,175
CHARGE INTAKE SYSTEM FOR A MULTI-INTAKE VALVE PER CYLINDER ENGINE
Aladar O. Simko, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Oct. 12, 1990, Ser. No. 596,436
Int. Cl.[5] F02B *15/00*
U.S. Cl. 123—193 H **16 Claims**



1. A charge intake system for an automotive type internal combustion engine having intake manifolding connected to an engine cylinder head, including, the head having a pair of side-by-side charge intake ports for each cylinder therein, the manifolding including a single air flow containing runner extending towards the head and having a bifurcated portion within the head to form a pair of separate air flow passages connecting the runner to the pair of ports in a siamesed manner, a bore extending through the head transverse to and intersecting all of the intake passages, and a one-piece barrel type valve member extending through the length of the bore, the valve member containing throttle valve type elements selectively located in the passages for controlling charge flow into the ports and rotatable between passage opening and blocking positions, the runner containing fuel injection means axially positioned upstream of the bifurcated portion for spraying fuel equally into the pair of passages.

5,069,176
INTERNAL COMBUSTION ENGINE
Max Ruf, Obereisesheim, and Erwin Korostenski, Oedheim, both of Fed. Rep. of Germany, assignors to Audi AG, Ingolstadt, Fed. Rep. of Germany
Continuation of Ser. No. 43,932, Apr. 29, 1987, abandoned. This application Nov. 13, 1989, Ser. No. 436,099
Claims priority, application Fed. Rep. of Germany, May 16, 1986, 3616629
Int. Cl.[5] F02F *1/24*
U.S. Cl. 123—193 H **9 Claims**



1. Internal-combustion engine with a cylinder crankcase (2) and a light-metal cylinder head (1), which is connected with the cylinder crankcase by bolts (9) having a thread 16, which extend in each case through a borehole (19) in the cylinder head and are bolted into a threaded borehole (11) in the cylinder crankcase and have heads (12) which act together positively with the cylinder head, wherein the borehole (10) in the cylinder head (1) has a thread, into which a threaded sleeve (15) of a material that is harder than the cylinder head is screwed, the threaded sleeve (15) having a thread in a direction opposite to the thread (16) of the cylinder bolt head (9), said threaded sleeve (15) having an outer face (17) forming the bearing surface for the head (12) of the cylinder head bolt (9), and said threaded sleeve (15) has an external diameter which corresponds essentially to the external diameter of the head (12) of the cylinder head bolt (9).

5,069,177
PRELUBRICATION APPARATUS
Jindrich Dokonal, Mt. View Ave. #11, Mt. View, Calif. 94040
Filed Dec. 31, 1990, Ser. No. 636,189
Int. Cl.[5] F01M *1/18*
U.S. Cl. 123—196 S **5 Claims**

1. A prelubrication apparatus in combination with an internal combustion engine,

the internal combustion engine including an oil galley conduit in operative association with an internal combustion engine, wherein the apparatus comprises an accumulator reservoir spaced from the internal combustion engine, and

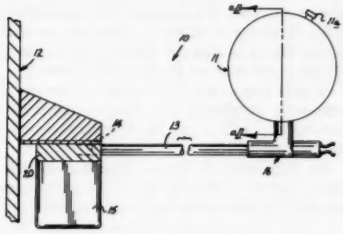
a solenoid valve operatively mounted to the accumulator reservoir, and

a lubricant feed conduit in fluid communication with the accumulator reservoir through the solenoid valve at a forward terminal end of the lubricant feed condiut, and

a rear terminal end of the feed conduit in fluid communication with the oil galley conduit, and

wherein the accumulator reservoir includes a pressurized air upper chamber with the upper chamber including a pres-

surizing valve to permit selective pressurizing of the upper chamber, and the accumulator reservoir including a fluid lubricant lower chamber containing a lubricating fluid therewithin, and a flexible membrane coextensive with and dividing the accumulator reservoir to effect pressurizing the lower chamber by the upper chamber, and



wherein the oil galley conduit includes a feed conduit coupling with the rear terminal end of the lubricant feed conduit mounted to the feed conduit coupling, and a check valve operatively mounted to the rear terminal end of the lubricant feed conduit.

5,069,178

ENGINE WITH VARIABLE COMBUSTION CHAMBER

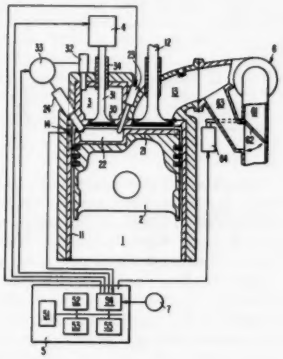
Hideo Kawamura, Samukawa, Japan, assignor to Isuzu Motors Limited, Tokyo, Japan

Filed Sep. 28, 1990, Ser. No. 589,545

Claims priority, application Japan, Sep. 30, 1989, 1-256418

Int. Cl.[5] F02B *19/00*

U.S. Cl. 123—256 **7 Claims**



1. An engine comprising:

a cylinder;

a piston slidably disposed in said cylinder;

a first combustion chamber defined in said piston;

a cylinder head mounted on said cylinder;

a second combustion chamber defined in said cylinder head and communicating with said cylinder through a communication port;

a valve mounted in said cylinder head for opening and closing said communication port;

intake and exhaust passages communicating with said cylinder;

a first fuel injection nozzle for injecting fuel into said first combustion chamber;

a second fuel injection nozzle for injection fuel into said second combustion chamber;

fuel supply means for supplying fuel to one of said first and second fuel injection nozzles at a time;

valve actuating means for actuating said valve to open and close said communication port;

load detecting means for detecting a load on the engine; and

control means for operating said valve actuating means to open said valve and controlling said fuel supply means to supply fuel to said second fuel injection nozzle when the load on the engine as detected by said load detecting means is equal to or higher than a predetermined value, and for operating said valve actuating means to close said valve and controlling said fuel supply means to supply fuel to said first fuel injection nozzle when the load on the engine as detected by said load detecting means is lower than said predetermined value.

5,069,179

INTERNAL COMBUSTION ENGINE

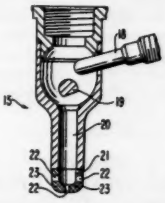
Johann Krämer, Leonberg, and Rainer Renz, Stuttgart, both of Fed. Rep. of Germany, assignors to Mercedes-Benz AG, Fed. Rep. of Germany

Filed Oct. 25, 1999, Ser. No. 604,006

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1989, 3935497

Int. Cl.[5] F02B *19/14, 19/00;* **C22C** *19/00*

U.S. Cl. 123—270 **11 Claims**



3. Internal combustion engine comprising a main combustion chamber and a secondary combustion chamber which is arranged in a cylinder head of the internal combustion engine and is connected via a shot channel to the main combustion chamber, wherein at least one of a burner base of the secondary combustion chamber and a deflecting pin arranged in the secondary combustion chamber, which are acted upon by a hot gas jet, are made of the material Ni_3Al intermetallic phase.

5,069,180

AUTOMATIC CHOKE APPARATUS AND METHOD

Thomas A. Schmidt, Eden Prairie; David A. Overland, Cedar; Paul F. Huffman, Blaine, and Paige R. Nelson, Minnetonka, all of Minn., assignors to Onan Corporation, Minneapolis, Minn.

Filed Oct. 19, 1990, Ser. No. 600,446

Int. Cl.[5] F02D *31/00;* **F02M** *1/02*

U.S. Cl. 123—376 **21 Claims**

1. A method of preventing stalling during starting of an internal combustion engine in cold ambients comprising the steps of:

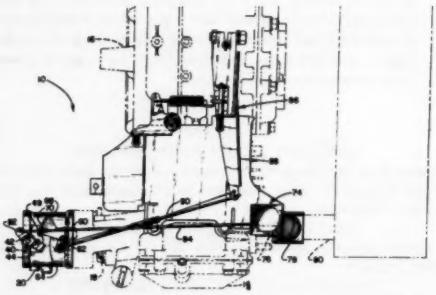
providing a carburetor mountable to the engine having an air inlet, a fuel inlet, and an air and fuel mixture outlet, the carburetor further having a choke plate rotatably mounted in an interior of the carburetor and a choke shaft arm connected to the choke plate, the choke shaft arm rotatably moving the choke plate, the carburetor further having a throttle plate rotatably mounted in the interior of the carburetor downstream of the choke plate and a throttle lever connected to the throttle plate, the throttle lever rotatably moving the throttle plate, the throttle lever mechanically linked with the choke shaft arm during rotational movement of the throttle plate to cause rotational movement of the choke plate;

positioning the choke plate in a closed position wherein a

flow of fuel entering the engine is greater than when in an open position;

positioning the throttle plate in an open position wherein a flow of air and fuel mixture exiting the carburetor at the air and fuel mixture outlet is greater than when in a closed position;

starting the engine; and



rotating the throttle plate toward the closed position after the engine is started wherein the flow of air and fuel mixture exiting the carburetor is decreased, the rotation of the throttle plate causing the throttle lever to slideably engage the choke shaft arm, rotation of the choke shaft arm causing rotation of the choke plate toward the open position wherein the flow of fuel entering the engine is decreased.

5,069,181

OUTPUT CONTROL APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Kazuhide Togai, Takatsuki; Yoshiaki Danno, Kyoto; Masato Yoshida, Kyoto; Makoto Shimada, Kyoto, and Katsunori Ueda, Kyoto, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

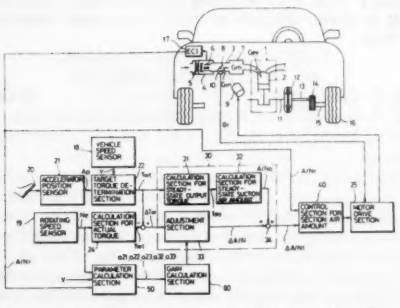
PCT No. PCT/JP90/00063, § 371 Date Sep. 18, 1990, § 102(e) Date Sep. 18, 1990, PCT Pub. No. WO90/08889, PCT Pub. Date Sep. 8, 1990

PCT Filed Jan. 19, 1990, Ser. No. 573,133

Claims priority, application Japan, Jan. 31, 1989, 1-21278; Jan. 31, 1989, 1-21285; Jan. 31, 1989, 1-21286

Int. Cl.[5] F02D *7/00*

U.S. Cl. 123—399 **8 Claims**



1. An output control apparatus for an internal combustion engine, comprising:

adjusting means for varying the output of the internal combustion engine mounted on an automobile in accordance with an adjusting variable;

means for determining a target torque of a driving shaft of the automobile;

means for detecting an actual torque of the driving shaft;

means for obtaining a deviation between the target torque and the actual torque obtained by said target and actual torque determining means;

means for obtaining a steady-state output torque of the internal combustion engine, required for applying the target torque to the driving shaft, on the assumption that the whole system of the automobile, including the internal combustion engine, is in a steady-state operation mode;

means for obtaining a reference adjusting variable of the adjusting means so that the steady-state output torque is produced in the internal combustion engine;

means for obtaining a target adjusting variable of the adjusting means by correcting the reference adjusting variable in accordance with a feedback amount based on said deviation; and

means for regulating an actual adjusting variable of the adjusting means so that the actual adjusting variable becomes equal to the target adjusting variable.

5,069,182

IGNITION TIMING CONTROL APPARATUS FOR AN ENGINE

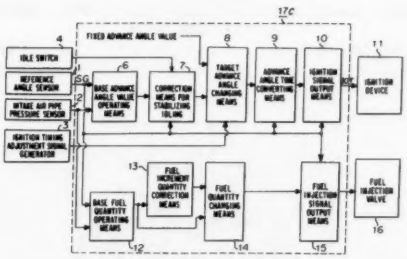
Hajime Kako, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 9, 1990, Ser. No. 520,948

Claims priority, application Japan, May 22, 1989, 1-129258; May 22, 1989, 1-129259

Int. Cl.[5] F02P *5/00;* **F02D** *5/00*

U.S. Cl. 123—418 **1 Claim**



1. A control apparatus for an engine which comprises a fuel control means which controls a fuel quantity in response to the operating conditions of an engine, a fuel supplying means to supply fuel on the basis of a signal from the fuel control means, an ignition timing adjustment signal generator, a target advance angle value changing means which selects a fixed advance angle value for ignition timing independent from the operating conditions of the engine when an instruction signal for adjusting the ignition timing is generated from the ignition timing adjustment signal generator, an ignition means which effects ignition in accordance with an output from the target advance angle value changing means and means for increasing the fuel quantity when the instruction signal for adjusting the ignition timing is generated from the ignition timing adjustment signal generator.

5,069,183

MULTI-CYLINDER ENGINE CONTROL METHOD AND ELECTRONIC CONTROL APPARATUS THEREFOR

Masami Nagano; Takeshi Atago, and Mamoru Nemoto, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Eng Co., Ltd., Ibaraki, both of, Japan

Filed Oct. 12, 1989, Ser. No. 420,519

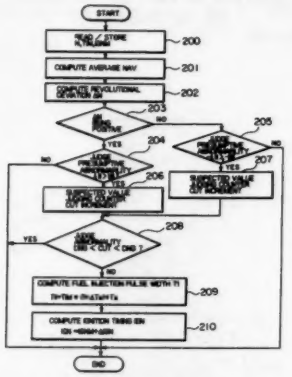
Claims priority, application Japan, Oct. 17, 1988, 63-259479

Int. Cl.[5] F02D *41/04;* **F02P** *5/15*

U.S. Cl. 123—419 **7 Claims**

1. A multi-cylinder engine control method comprising de-

tecting rotating speeds of the multi-cylinder engine at explosion strokes of respective cylinders mounted in said engine for obtaining estimated combustion pressures in said respective cylinders, determining respective deviations of said combus-



tion pressures in said cylinders from said estimated combustion pressures in said cylinders, and regulating at least one of ignition timing and fuel amounts supplied to said respective cylinders in accordance with said deviations of said combustion pressures.

5,069,184

APPARATUS FOR CONTROL AND INTAKE AIR AMOUNT PREDICTION IN AN INTERNAL COMBUSTION ENGINE

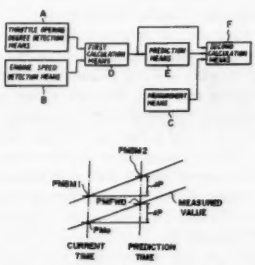
Senji Kato, Toyota, and Hidehiro Oba, Aichi, both of Japan, assignors to Toyoto Jidosha Kabushiki Kaisha, Japan

Division of Ser. No. 362,770, Jun. 7, 1989, Pat. No. 5,003,950. This application Nov. 30, 1990, Ser. No. 620,212

Claims priority, application Japan, Jun. 15, 1988, 63-147850; Jul. 30, 1988, 63-191153

Int. Cl.[5] F02D *41/02;* F02P *5/15*

U.S. Cl. 123—422 **8 Claims**



1. An internal combustion engine control apparatus comprising:

a first detection means for detecting a degree of throttle opening;

a second detection means for detecting the engine speed;

measurement means for measuring a value of the pressure on a side upstream of the throttle;

prediction means for predicting a value for a future point in a ceetain period in advance of said current time, of one of the amount of intake air taken into the combustion chamber and a physical quantity corresponding to the intake air amount onthe basis of the degree of throttle opening and the engine speed,

a correction means for using the value meaured by said measurement means to correct the value predicted by said prediction means; and

a control means to control one of both of the fuel injection duration and the spark timing on the basis of the corrected predicted value and engine speed.

5,069,185

DIESEL TUNE-UP METHOD

Robert J. Evasick, San Diego, Calif., assignor to Edward J. Evasick, San Ysidro, Calif.

Filed Jun. 15, 1990, Ser. No. 538,568

The portion of the term of this patent subsequent to Oct. 24, 2006, has been disclaimed.

Int. Cl.[5] F02M *7/00*

U.S. Cl. 123—435 **10 Claims**

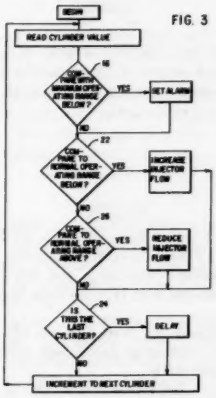


FIG. 3

1. A method for improving the performance of a multi-cylindered internal combustion engine having fuel injection by injectors controlled by an electronic controller, with the cylinders having internal thermodynamic operating values, comprising the following steps:

(a) With electronic thermodynamic value transducers, sensing the operating values inside the individual cylinders of the engine;

(b) With the electronic controller connected to the transducers, comparing the various thermodynamic operating values within the various cylinders to a standard thermodynamic value; and

(c) Controlling the injectors such that cylinders operating at least a minimum amount below said standard thermodynamic value receive more fuel, thus elevating the thermodynamic operating value in the respective cylinder, and cylinders operating at values at least a minimum amount above said standard thermodynamic value receive relatively less fuel, such that thermodynamic operating values in the individual cylinders of said engine tend toward said standard thermodynamic value.

5,069,186

FUEL INJECTION ASSEMBLY FOR INTERNAL COMBUSTION ENGINE

Mario Illien, Quarry Road, Brixworth, Northamptonshire, England NN6 9EN

Filed Jan. 17, 1990, Ser. No. 465,742

Claims priority, application United Kingdom, Jan. 19, 1989, 8901132

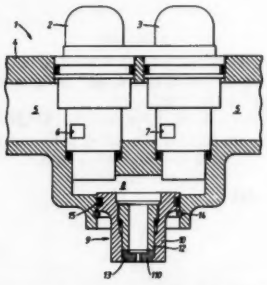
Int. Cl.[5] F02M *55/02*

U.S. Cl. 123—470 **5 Claims**

1. A fuel injection assembly for an internal combustion engine comprising:

at least two solenoid valves, the outlets of which are connected to a common chamber; and

at least one spray nozzle forming the downstream end of said



common chamber to provide a spray of fuel in response to opening of at least one of the solenoid valves, there being no valve located between said solenoid valves and the outlet of said spray nozzle.

5,069,187

FUEL SUPPLY CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

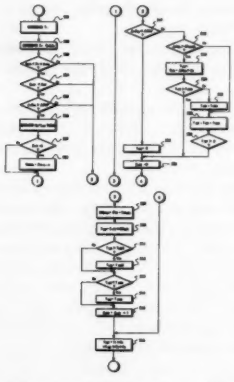
Akira Kato; Takafumi Nishikawa, and Shun Masuda, all of Wako, Japan, assignors to Honda Giken Kogyo K.K., Tokyo, Japan

Filed Aug. 30, 1990, Ser. No. 575,080

Claims priority, application Japan, Sep. 5, 1989, 1-104472[U]; Sep. 11, 1989, 1-107118[U]

Int. Cl.[5] F02M *51/00*

U.S. Cl. 173—492 **12 Claims**



1. In a fuel supply control system for an internal combustion engine having an intake pipe, and a throttle valve arranged in said intake pipe, wherein a basic value of a fuel amount to be supplied to said engine is determined based on a load on said engine, and the determined basic value of said fuel amount is corrected by a correction value for increasing said fuel amount during and/or after acceleration of said engine, said correction value being determined based on a change in the opening degree of said throttle valve,

the improvement comprising correction value decreasing means for decreasing said correction value with increase in the magnitude of said load on said engine.

5,069,188

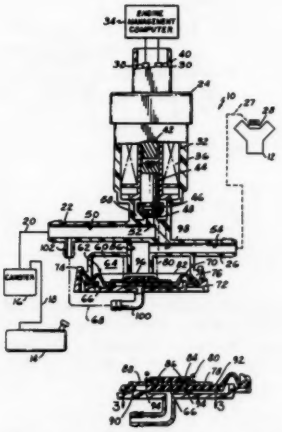
REGULATED CANISTER PURGE SOLENOID VALVE HAVING IMPROVED PURGING AT ENGINE IDLE

John E. Cook, Chatham, Canada, assignor to Siemens Automotive Limited, Chatham, Canada

Filed Feb. 15, 1991, Ser. No. 656,930

Int. Cl.[5] F02M *33/02*

U.S. Cl. 123—520 **10 Claims**



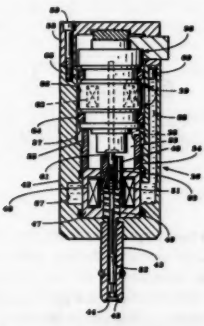
1. In a regulated canister purge solenoid valve for purging fuel vapor that has been collected in a collection canister to an intake manifold of an internal combustion engine so that the collected vapor can entrain with combustion flow into combustion chamber space of the engine, said valve having body structure including an inlet port for connection to such a canister, an outlet port for connection to such a manifold, and a flow path between said inlet port and said outlet port which is controlled by a solenoid-operated valve means in accordance with a received electrical control signal, said valve also having regulator means which has a movable wall that divides a chamber of said body structure into two chamber spaces on opposite sides of said wall, one of said chamber spaces forming a portion of said flow path that is disposed between said solenoid-operated valve means and said outlet port and has an entrance for vapor flow entering said one chamber space and an exit for vapor flow exiting said one chamber space, said regulator means further having regulator valve means that is controlled by said movable wall and is disposed at said exit from said one chamber space for rendering the vapor flow through said flow path substantially insensitive to the magnitude of intake manifold vacuum at said outlet port, and spring means that biases said movable wall toward a position that maximally opens said regulator valve means, the improvement which comprises:

passage means placing the other of said chamber spaces in communication with said inlet port, and orifice valve means providing selective communication between said one chamber space and said other chamber space in accordance with the position of said movable wall, said orifice valve means comprising orifice means between said one and said other chamber spaces which provides between said one and said other chamber spaces for all positions of said movable wall other than when said movable wall is in position that maximally opens said regulator valve means a particular pressure vs. flow characteristic in relation to flow of vapor through said flow path between said inlet port and said outlet port, said orifice valve means closing said orifice means when said movable wall is in position that maximally opens said regulator means.

5,069,189
FUEL INJECTOR SYSTEM FOR INTERNAL COMBUSTION ENGINE

Chitoshi Saito, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 27, 1990, Ser. No. 544,422
Claims priority, application Japan, Jun. 27, 1989, 1-164380
Int. Cl.[5] F02M *68/08*
U.S. Cl. 123—533 13 Claims

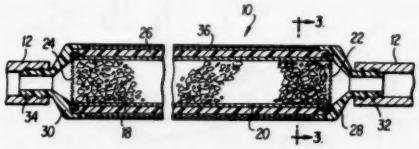


1. A fuel/air injector unit for injecting fuel and air under pressure into an internal combustion engine comprising a fuel injector for injecting fuel, an air delivery valve for controlling the delivery of air, said air delivery valve including a solenoid for operating said air delivery valve, said solenoid having a winding, cooling jacket in proximity to said winding, and means for circulating fuel through said cooling jacket.

5,069,190
FUEL TREATMENT METHODS, COMPOSITIONS AND DEVICES

Charlie W. Richards, 324 Mineral Hill, Las Vegas, N. Mex. 87701

Filed Apr. 30, 1991, Ser. No. 693,620
Int. Cl.[5] F02M *33/00*
U.S. Cl. 123—538 19 Claims



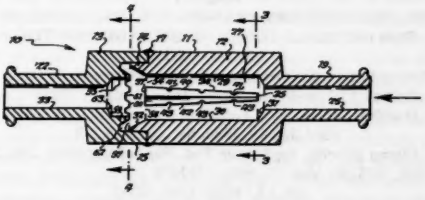
1. A method of operating an internal combustion engine or fuel combustion apparatus having a fuel line joining the engine or apparatus with a source of fuel supplied to the engine or apparatus, comprising the step of contacting the fuel prior to combustion with a microcrystalline alloy comprised of a major portion of silver, an effective amount of at least one platinum group metal and an effective amount of at least one rare earth and including isotopes thereof.

5,069,191
FUEL AGITATING DEVICE FOR INTERNAL COMBUSTION ENGINE

Douglas G. Scouten, 662 Chilton Ave., Niagara Falls, N.Y.

Filed Jul. 2, 1990, Ser. No. 547,806
Int. Cl.[5] F02M *33/00*
U.S. Cl. 123—538 30 Claims

1. An agitator for fuel being conducted to an internal combustion engine comprising a casing, a fuel inlet conduit in said casing, a fuel outlet conduit in said casing, a chamber within said casing between said fuel inlet conduit and said fuel outlet conduit, said chamber including an entry portion proximate said fuel inlet conduit and an exit portion proximate said fuel outlet conduit and a central portion between said entry portion and said exit portion, flow divider means having a first divider portion in said entry portion and a second divider portion in

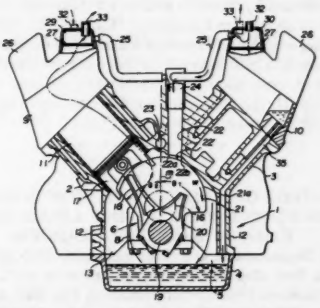


said central portion for dividing said entry portion and said central portion into two fuel flow paths on opposite sides thereof, an inner wall in said casing defining said exit portion, flange means on said casing spaced radially inwardly from said inner wall and located between said second divider portion and said exit portion, and conduit means within said flange means for conducting fuel to said outlet conduit.

5,069,192
INTERNAL COMBUSTION ENGINE WITH CRANKCASE VENTILATION SYSTEM

Eiichi Matsumoto, Yokohama City, and Tatsuo Aruga, Kawasaki City, both of Japan, assignors to Nissan Motor Company, Ltd., Yokohama City, Japan

Filed Oct. 19, 1990, Ser. No. 599,964
Claims priority, application Japan, Oct. 24, 1989, 1-124244[U]; Oct. 24, 1989, 1-124246[U]
Int. Cl.[5] F02M *25/00*
U.S. Cl. 123—572 29 Claims



1. An internal combustion engine comprising:
a cylinder block and an oil pan which are assembled together to define a crankcase;
a crankshaft rotatably held in said crankcase and including a counterweight;
means for defining a fresh air inlet passage through which the interior of said crankcase and the outside of the engine are communicated said fresh air inlet passage having a fresh air inlet opening exposed to the interior of said crankcase at a position close to said counterweight so that, under rotation of said crankshaft, said fresh air inlet opening is periodically covered and opened by said counterweight;
means for defining a blow-by passage through which the interior of said crankcase and the outside of the engine are communicated;
means for producing in said crankcase a pressure fluctuation,

said fluctuation cycling between a low and a high level during operation of the engine, and

means for causing said fresh air inlet opening to be covered by said counterweight when the pressure in said crankcase is at said high level and opened by said counterweight when the pressure in said crankcase is at said low level.

5,069,193

IGNITION PROCESS, ARANGEMENT AND APPARATUS FOR INTERNAL COMBUSTION ENGINES WITH A MAGNETO

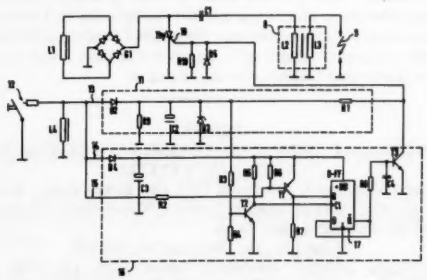
Werner Erhard, Cadolzburg, Fed. Rep. of Germany, assignor to Prüfrex-Elektro-Apparatebau Inh. Helga Müller geb. Dutschke, Cadolzburg, Fed. Rep. of Germany

Filed Jul. 19, 1990, Ser. No. 555,279

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1989, 3925224; May 31, 1990, 4017478

Int. Cl.[5] F02P *3/08, 5/145*

U.S. Cl. 123—602 **12 Claims**



1. In an ignition method for internal combustion engines, comprising inducing, with a magneto, a plurality of alternating voltage half-waves (I, II, III) for each engine revolution (T), to charge an energy storage element (C1) and discharge the storage element by a switch means (Thy) through the primary coil (L2) of an ignition transformer (L2, L3), the improvement comprising actuating the switch means (Thy) when the rising flank of the first half-wave (I) reaches a trigger threshold (U_{Th}) during each revolution (T), and blocking at least one of the half-waves (II, III) following the first half-wave (I), by stopping actuation of the switch means (Thy).

5,069,194

CONTROL OF A CHARGED, PISTON INTERNAL COMBUSTION ENGINE HAVING A PLURALITY OF EXHAUST GAS TURBOCHARGERS

Herbert Deutschmann, and Hans Sudmanns, both of Friedrichshafen, Fed. Rep. of Germany, assignors to MTU Motoren- Und Turbinen-Union, Friedrichshafen, Fed. Rep. of Germany

PCT No. PCT/DE89/00416, § 371 Date Mar. 12, 1990, § 102(e) Date Mar. 12, 1990, PCT Pub. No. WO90/01112, PCT Pub. Date Feb. 8, 1990

PCT Filed Jun. 23, 1989, Ser. No. 490,683

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1988, 3824373; Feb. 7, 1989, 3903563

Int. Cl.[5] F02P *9/00*

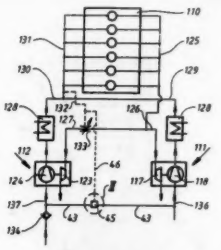
U.S. Cl. 123—612 **19 Claims**

1. A control arrangement for a charged, piston internal combustion engine having a plurality of exhaust gas turbochargers including at least one switchable exhaust gas turbocharger which is selectively operated and a continuously connected exhaust gas turbocharger operating in parallel therewith, each of the plurality of exhaust gas turbochargers having an exhaust gas turbine connected to an exhaust gas pipe and a charge air compressor connected to a suction pipe, the arrangement comprising:

a controllable exhaust gas blocking device for blocking passage of exhaust gas to the exhaust gas turbine of the at least one switchable exhaust gas turbocharger;

an automatically operating charge air blocking device for blocking the suction pipe of the charge air compressor of the at least one switchable gas turbocharger;

a bypass pipe connecting the suction pipe of the charge air compressor of the at least one switchable gas turbo-



charger, at a point upstream from the automatically operating charge air blocking device, with the suction pipe of the charge air compressor of the continuously connected exhaust gas turbocharger at a point upstream of the automatically operating charge air blocking device; and

a bypass blocking device for controllably blocking the bypass pipe.

5,069,195

APPARATUS FOR AUTOMATIC SEPARATION ALONG PREDETERMINED BENDING FRACTURE LINES IN BASIC CERAMIC PLATELETS OF HYBRID ELECTRONIC CIRCUITS

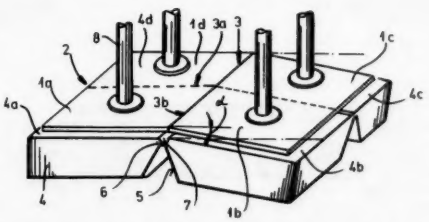
Gian P. Barozzi, Cremona, Italy, assignor to AISA S.P.A., Cremona, Italy

Filed Jun. 13, 1989, Ser. No. 365,458

Claims priority, application Italy, Jun. 16, 1988, 20991 A/88

Int. Cl.[5] B26F *3/00*

U.S. Cl. 125—23.01 **12 Claims**



1. An apparatus for automatically subdividing a basic ceramic platelet of hybrid electronic circuits into a plurality of single elements along a plurality of predetermined bending-fracture lines of said platelet, said apparatus comprising:

a support plate having a lower face and an upper face spaced from said lower face and parallel thereto, said upper face being juxtaposed with the ceramic platelet, said lower face being provided with:

a plurality of intersecting grooves open at and traversing said lower face, said grooves extending upwardly toward said upper face but terminating at a distance therefrom, said grooves forming boundaries defining a plurality of bays of said plate therebetween and defining bending lines connecting said bays and being in registry with the fracture lines of the platelet, said bays being rigid upon a successive bending of said support plate along said bending lines;

means juxtaposed with said upper face of the plate for

pressing each of the plurality of single elements to be separated against the respective bay of said plate;

a fixed support juxtaposed with said lower face of the plate and being in a continuous contact with one of said bays;

a plurality of retractable members facing said lower face of the plate and acting against others of said bays; and

means for controlling the retraction of said retractable members in a predetermined sequence upon the successive bending of said plate and the platelet by said means for pressing along said bending lines, so that the ceramic platelet is subdivided in the plurality of single elements along the fracture lines of the platelet.

5,069,196

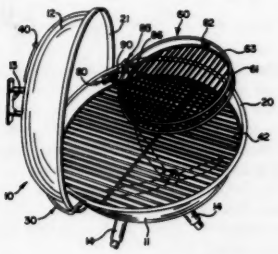
PIVOTING AUXILIARY RACK

Erich J. Schlosser, Barrington, and J. Michael Alden, Palatine, both of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.

Filed Aug. 23, 1990, Ser. No. 571,735

Int. Cl.[5] F24C *15/30*

U.S. Cl. 126—25 R **9 Claims**



1. An auxiliary rack assembly for suporting items above a cooking grid supported in a barbecue kettle comprising:

an auxiliary grid for holding the items thereon, said auxiliary grid being substantially flat and having integral perimeter means for preventing the items placed on said auxiliary grid from falling off;

means for maintaining said auxiliary grid in a constantly spaced position above the cooking grid; and

means for rotatably connecting said grid and maintaining means to of the kettle.

5,069,197

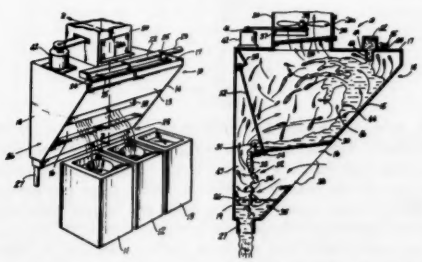
FUME HOOD

Walter L. Wisting, 125 Squires Glen Rd., Madison, Conn. 06443

Filed Sep. 26, 1990, Ser. No. 588,163

Int. Cl.[5] F24C *15/20*

U.S. Cl. 126—299 E **12 Claims**



1. A hood adapted to remove contaminants from incoming airflow and adapted to be positioned above a cooking apparatus compromising a housing member, said housing member having top, front, back and side walls, and defining a lower liquid sump, an upper exhaust opening in said top wall, an inlet opening defined in the front wall of said housing member above said defined sump, said front wall being inclined inwardly and downwardly, a partition extending between said side walls from said front wall and having a free end, said partition being inclined downwardly toward its free end, the free end of said partition being above sump, said a screen having openings therein extending between said side walls and from the free end of said partition into said sump, said screen, the lower end of said partition and said back wall defining an air passage into an upper portion of said hood, said partition having means on the free end thereof defining a liquid dam having a horizontal upper edge, a liquid header means mounted to and extending across said top wall and having a plurality of spaced apart nozzles extending into said housing member above said front wall and said partition, said header means being external of said top wall, means for drawing liquid from said sump and delivering the liquid to said header whereby the liquid will overflow the dam on said partition and fall in a sheet and move across the openings in said screen to said sump, whereby air passing into said inlet opening and through said housing member passes through the liquid moving across the openings in said screen and then through an agglomeration of liquid from said nozzles, and means for drawing air from said inlet opening through said housing and said exhaust opening.

5,069,198

FOOD STEAMING APPARATUS

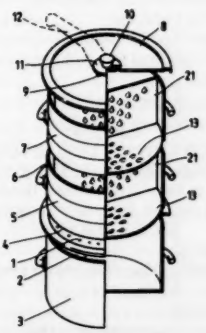
Henning M. Henderson, No. 2 Club View, Cnr. Nigel & Hills Roads, Selection Park, Springs, Transvaal Province, South Africa

Filed Jul. 11, 1990, Ser. No. 550,904

Claims priority, application South Africa, Jul. 12, 1989, 89/5286

Int. Cl.[5] F24D *1/00*

U.S. Cl. 126—369 **18 Claims**



1. Food steaming apparatus comprising a tubular body and at least one generally horizontally extending perforated food support, said food support including means for imparting a transverse component to the direction of travel of steam rising substantially vertically prior to passage through said perforations said means for imparting comprising deflector zones adjacent said perforations, said deflector zones being positioned to guide the steam through the perforations.

5,069,199

DEVICE SUITABLE FOR PRODUCING A THERMAL FLOW INSIDE A THERMAL INTEGRAL BLOCK

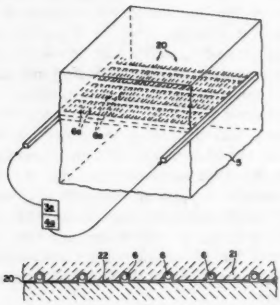
Casper O. H. Messner, Gut Roseberg, Feldbach, Switzerland

PCT No. PCT/CH88/00060, § 371 Date Jan. 10, 1989, § 102(e) Date Jan. 10, 1989, PCT Pub. No. WO88/07160, PCT Pub. Date Sep. 22, 1988

PCT Filed Mar. 17, 1988, Ser. No. 302,237

Int. Cl.[5] F24H *7/02*

U.S. Cl. 126—400 **26 Claims**



1. A device suitable for storage and absorption or dispensing of heat comprising:

a body of low thermal conductivity of less than 20 W/mK suitable for storage and absorption of heat;

means for conveying heat to and from a heat transporting medium to the body, wherein the conveying means includes a plurality of tubes for the flow of heat therethrough;

at least one heat transporting layer thermally connected to the body for supplying heat to and for withdrawing heat from the body in one or more essentially parallel planes, the at least one heat transporting layer having a surface that is in direct thermal contact with the conveying means for transferring the heat to and from the heat transporting medium, wherein the at least one heat transporting layer mates with each tube so that less than half of the surface area of each tube is in contact with the at least one heat transporting layer,

wherein the at least one heat transporting layer consists of a material having a thermal conductivity coefficient greater than that of the body, and

wherein the layer is positioned transverse to the direction in which heat flows from the heat transporting medium to the body.

5,069,200

GAS-FIRED ARTIFICIAL LOG ASSEMBLY

Ian Thow, Merseyside, England, and Ajay K. Gupta, Cincinnati, Ohio, assignors to Valor Incorporated, Hendersonville, Tenn.

Filed Feb. 27, 1991, Ser. No. 661,887

Int. Cl.[5] F24C *3/00*

U.S. Cl. 126—512 **17 Claims**

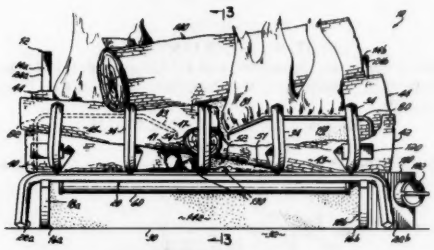
1. A gas-fired artificial log assembly for fireplaces and stoves comprising:

a support structure;

a base plate of a refractory material that glows visibly above about 1470° F., said base plate being supported by said support structure and having an upper surface;

at least one front artificial log member having first and second distal end sections and a medial section, said at least one front log member supported by said upper surface of said base plate, means defining a channel between said upper surface of said base plate and said at least one front leg member;

primary gas burner means supported by said support structure and extending along and in front of said at least one front log member and said channel and defining a combustion zone therebetween, said primary gas burner means for directing blue flame jets against said base plate, said at least one front log member and into said channel for heating to a visible glow at least portions of said base plate and said at least one front log member, whereby substantial heat is radiated to the surroundings and an appearance of glowing logs and underlying embers is provided to enhance the aesthetics of the artificial log fireplace;



a rear artificial log supported by said support structure and spaced from said at least one front log member; and

neat gas burner means located between said rear artificial log and said at least one front log member for issuing flame jets generally upwardly to enhance the realism of the artificial log assembly;

whereby, the flame from said primary gas burner means which passes into said channel ignites said neat gas burner means and causes at least a portion of said rear artificial log to glow visibly.

5,069,201

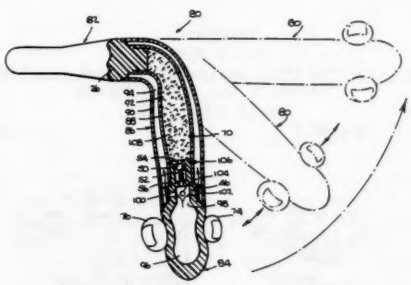
PENILE PROSTHESIS AND METHOD

Norman R. Zinner, 23451 Madison St. Ste. 340, Torrance, Calif. 90505, and Arthur M. Sterling, 11748 Manorwood Dr., Baton Rouge, La. 70815

Filed Apr. 20, 1990, Ser. No. 511,563

Int. Cl.[5] A61F *2/26*

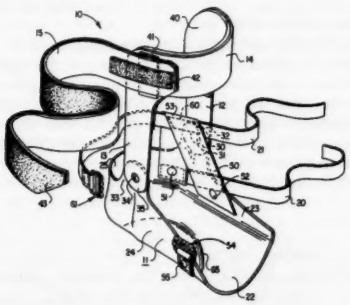
U.S. Cl. 128—79 **31 Claims**



1. A penile prosthesis comprising a normally flaccid but selectively rigidifiable axially elongate main body portion, a proximal end portion extending from a corresponding proximal end of the main body portion, and a distal end portion extending from a corresponding distal end of said main body portion, said main body portion including at least one chamber for receiving fluid, filler means in said one chamber to reduce the fluid fill capacity of said one chamber, said filler means being positioned in said one chamber such that fluid in said one chamber contacts said filler means, pumping means communicable with said one chamber and actuatable for pumping fluid

in a predetermined fluid flow direction between said one chamber and said pumping means, and valve means disposed between said pumping means and said one chamber and cooperable with said pumping means for controlling the predetermined fluid flow direction between said one chamber and said pumping means during actuation of said pumping means such that movement of said fluid in said predetermined fluid flow direction in response to activation of said pumping means causes rigidification of said one chamber, and wherein said filler means is disposed in said one chamber to extend radially across said one chamber to prevent change in the radial magnitude of said one chamber in a predetermined radial direction when said one chamber is rigidified.

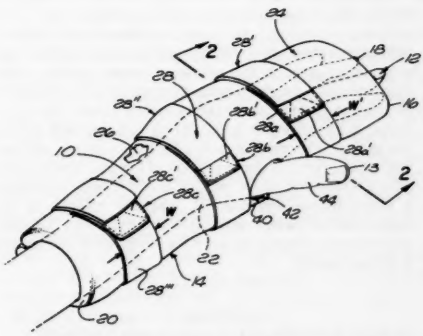
5,069,202
ANKLE BRACE
Steven D. Prock, 120 S. Crockett, Sherman, Tex. 75090
Filed Nov. 5, 1990, Ser. No. 609,260
Int. Cl.[5] A61F *5/00*
U.S. Cl. 128—80 H **24 Claims**



1. An ankle brace comprising:
a foot support shell having a bottom plate, upright lateral and medial sidewalls, and a rounded posterior wall;
a lateral upright member hinged at a first end to the upright lateral sidewall;
a medial upright member hinged at a first end to the upright medial sidewall;
a curved anterior band secured at opposite ends with the second ends of the lateral and medial uprights for positioning across the front of the leg of a wearer against the tibia crest;
a leg strap securable around a leg of a wearer of the brace and the anterior band to hold the band against the tibia crest of the wearer;
a foot strap secured along a first end to a rearward portion of the upright lateral sidewall and securable at a forward angle across the top of a foot of the wearer to a forward portion of the medial upright sidewall; and
an ankle strap secured from a position above and inside of the lateral upright sidewall free of the lateral upright and connectable around the ankle of a wearer above the lateral and medial melleoli of the wearer outside of the medial upright member.

5,069,203
SOFT HAND AND WRIST SPLINT
Janet P. Anderson, 21052 Winfield Rd., Topanga, Calif. 90290
Filed Mar. 23, 1989, Ser. No. 328,522
Int. Cl.[5] A61F *5/04*
U.S. Cl. 128—87 R **19 Claims**

1. A hand splint of the type adapted to reduce hand and wrist flexion contractures and comprising, in combination:
a soft, flexible resilient body member having a first preselected indentation load deflection and at least a first preselected density in predetermined regions thereof, and further having a predetermined length and predetermined width, said predetermined length comprising a length extending from regions adjacent a user's fingertips a preselected distance towards such users elbow, said predetermined width comprising a width sufficient to wrap said body member around the hand of the user, and said body member in close proximity to the user's fingers and wrist for exerting a predetermined resilient force thereon for reducing flexion contractures of said fingers and wrist, and said body member further having:
an outer surface;
an inner surface, and a preselected thickness between said outer surface and said inner surface;
a first end positionable in regions adjacent a user's fingertips;
a second end spaced said preselected length from said first end;
a first lateral edge; and
a second lateral edge spaced said preselected width from said first lateral edge, and said first lateral edge in regions adjacent said second lateral edge for the condition of said body member applied to a user's hand;
a one-way stretch soft covering extending at least over said outer surface and said inner surface of said body member;



a plurality of strap means on said soft covering and overlying said outer surface of said body member in a predetermined spaced array and extending therearound in directions transverse to said first and second lateral edges for retaining the hand splint on the user's hand, and said plurality of strap means having a predetermined strap width;
securing means cooperating with said strap means to retain said hand splint on the user;
said body member having first walls defining a thumb receiving aperture therethrough in a predetermined location thereof in regions adjacent said first end of said body member for allowing a user's thumb to project through said body member from said inner surface to said outer surface for the condition of said body member applied to a user;
said covering has second walls defining an aperture therethrough, and said second walls in registerable alignment with said first walls to allow the user's thumb to project therethrough; and
free of rigid support members preventing hand or wrist flexion contractures.

5,069,204

INHALER

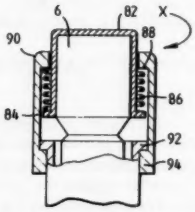
David K. Smith, Loughborough, and Anthony C. L. Wass, Stamford, both of United Kingdom, assignors to Riker Laboratories, Inc., St. Paul, Minn.

Filed Aug. 17, 1990, Ser. No. 569,071

Claims priority, application United Kingdom, Aug. 23, 1989, 8919131

Int. Cl.[5] A61M *11/00*

U.S. Cl. 128—200.23 **5 Claims**



1. An inhalation device comprising:

(i) a breath-actuated inhaler comprising: a medicament reservoir which comprises an aerosol vial containing propellant and medicament and equipped with a dispensing valve; and a housing which comprises a mouthpiece and breath-actuation means which prevents dispensing from the reservoir until a patient inhales through the mouthpiece, wherein the medicament reservoir is mounted within the housing, and

(ii) a protective casing surrounding the breath-actuated inhaler, the casing comprising a body portion, a means for applying a cocking force to the breath-actuated inhaler, and a cover that is movable between a closed position and a displaced position that allows a patient access to the mouthpiece to use the breath-actuated inhaler whilst it is within the casing, the breath-actuated inhaler being removable from the protective casing and operable outside the casing, wherein the means for applying the cocking force comprises: an upper portion of the protective casing which is mounted on the remainder of the body portion by a screw thread arrangement, whereby rotation of the upper portion causes movement thereof along the body portion; and a spring means to actually cock the breath-actuated inhaler.

5,069,205

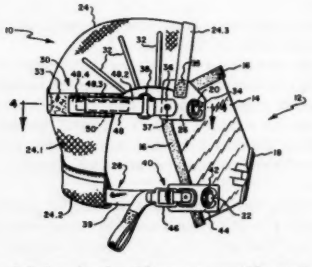
QUICK-DONNING HEAD HARNESS ASSEMBLY

Tina Urso, Amherst, N.Y., assignor to Figgie International, Inc., Willoughby, Ohio

Filed Apr. 20, 1990, Ser. No. 512,784

Int. Cl.[5] A62B *7/00*

U.S. Cl. 128—201.24 **6 Claims**



1. The quick-donning head harness assembly used in combination with a face mask assembly intended for eye and respiratory protection, the face mask assembly having upper and lower side portions to which the head harness assembly is secured, the head harness assembly being capable of quickly suspending the face mask assembly in front and aligning it with the wearer's face, leaving hands free for quickly adjusting upper and lower seal tightness to provide a continuous seal between the perimeters of the face mask assembly and face whereby penetration of contaminants past the seal is minimized; and said head harness assembly comprising:

a cap having a front portion, a top portion, a lower back portion and an intermediate portion, said cap being suitably contoured to fit portions of the back, top and sides of the wearer's head;

nonadjustable constant length securing means for securing the upper side portions of the face mask assembly to the front portion of the cap for suspending the face mask assembly and enabling quick alignment of the face mask assembly in front of the wearer's face;

lower manually adjustable length securing means for securing the lower back portion of the cap to the lower side portions of the face mask assembly for pulling the lower side portions of the face mask assembly inward and towards the face into sealing contact with at least the lower portion of the face; and

upper manually adjustable length securing means for securing the intermediate portion of the cap to the upper side portions of the face mask assembly for pulling the upper side portions of the face mask assembly inward and towards the face into sealing contact with at least the upper portion of the face including the temples, the intermediate portion of the cap being located between the front portion and the lower back portion of the cap.

5,069,206

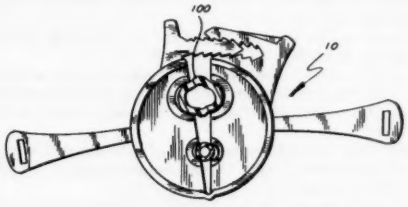
ENDOTRACHEAL TUBE CLUTCH

David B. Crosbie, 13228 Highview Dr., Burnsville, Minn. 55337

Filed Jun. 11, 1990, Ser. No. 535,515

Int. Cl.[5] A61M *16/00*

U.S. Cl. 128—207.17 **4 Claims**



1. Endotracheal tube clutch for gripping an adult endotracheal tube or a pediatric endotracheal tube comprising:

a. a semicircular left half member including a left wing, a male locking member with a plurality of serrated teeth, a large semicircular hole and a partial cylindrical member extending upwardly about said large hole, a small circular hole and a partial cylindrical member extending upwardly about said small hole, and a semicircular bite block extending downwardly about said large hole;

b. a semicircular right half member including a right wing, a female locking member with a plurality of serrated grooves, a large semicircular hole and a partial cylindrical member extending upwardly about said large hole, a semicircular small hole and a partial cylindrical member extending upwardly about said small hole and a semicircular bite block about said large hole; and,

c. a living hinge connecting one end of said left half member to one end of said right half member whereby movement about said living hinge causes said left half member and said right half member to engage with respect to each other forming holes with surrounding cylindrical mem-

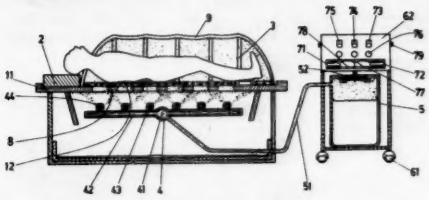
bers for engaging endotracheal tubes, as well as forming a bite block about said large hole.

5,069,207

PHYSIOTHERAPY HEALTHY DEVICE

Shin-Hsiung Lin, 3, Alley 40, Sun-Chu Rd., Chang-Hua, Taiwan

Filed Jul. 23, 1990, Ser. No. 556,317
Int. Cl.[5] A61H *33/00*
U.S. Cl. 128—366 10 Claims



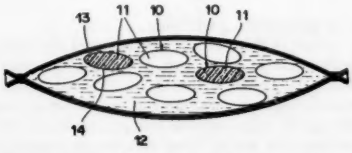
1. A physiotherapy device comprising:
a bed structure having a generally horizontally disposed upper plate, said upper plate having a length sufficient for a user to lay longitudinally therealong and a plurality of orifices therein;
an apertured plate which forms a network having apertures and which rests on said upper plate wherein the user lies on the apertured plate;
a plurality of spray nozzles, each of which is mounted below a respective said orifice of said upper plate for spraying upwardly through said orifices and said apertured plate;
a shade including supports providing a space therebeneath for a user, and a canvas covering said supports, said shade and canvas being raisable and lowerable to permit the user to enter and lie down on the apertured plate; and
a controller including a heating tank filled with a suitable physiotherapeutic liquid, a conduit means for delivering the heated liquid to said spray nozzles, and a control unit for controlling a heating of the liquid in said heating tank and the timing of delivery of the liquid to said spray nozzles.

5,069,208

THERAPEUTIC DEVICE COMPRISING A MASS OF A THERMALLY ACTIVE MATERIAL

René Noppel, Préverenges, and Kurt Wuillemin, Fribourg, both of Switzerland, assignors to Term-ac S.A., Fribourg, Switzerland

Continuation of Ser. No. 180,113, filed as PCT/CH87/00029 Mar. 9, 1987, published as WO87/06825 Nov. 11, 1987, abandoned. This application Dec. 26, 1989, Ser. No. 455,924
Claims priority, application Switzerland, May 16, 1986, 2000/86
Int. Cl.[5] A61F *7/02*
U.S. Cl. 128—403 14 Claims



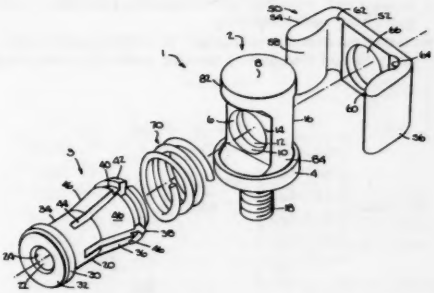
1. A thermal-action therapeutic device comprising:
a heat-exchanging agent comprising a non-gaseous fluid;
a number of independent cells, each comprising a mass of thermally active material which undergoes a change of state at a predetermined temperature and a fluid-tight closed covering with thin walls enclosing each cell of said mass of thermally active material, said cells being embedded in and independently movable within said heat exchanging agent; and
a closed fluid-tight wrapping wrapped around said heat exchanging agent and said independent cells.

5,069,209

ELECTRICAL TERMINAL

Jack Posin, Allawah, Australia, assignor to Telectronics Pacing Systems, Inc., Englewood, Colo.

Filed Sep. 21, 1990, Ser. No. 586,772
Int. Cl.[5] A61N *1/02*
U.S. Cl. 128—419 P 25 Claims



1. A terminal for detachably connecting an electrical lead to an electrical device, comprising:
a support structure adapted to be fixed to said device;
a movable structure adapted to be carried by said support structure for movement between first and second positions relative to said support structure, said movable structure having at least two wall members thereon movable relatively toward and away from one another between a first spaced apart position less than the diameter of said electrical lead and a second spaced apart position greater than the diameter of said electrical lead for receiving and releasing said lead in said second spaced apart position and for gripping said lead in said first spaced apart position;
means for moving said movable structure between said first and second positions; and,
first camming means carried by each of said structures and engageable with the camming means on the other of said structures for camming said wall members from one to another of said spaced apart positions.

5,069,210

COCHLEAR IMPLANT EMPLOYING FREQUENCY-DIVISION MULTIPLEXING AND FREQUENCY MODULATION

Dean C. Jeutter; Fabien J. Josse, both of 1515 W. Wisconsin Ave., Milwaukee, Wis. 53233, and James C. Han, 1057 E. 5600 South, Salt Lake City, Utah 84121

Filed Apr. 17, 1989, Ser. No. 339,479
Int. Cl.[5] A61N *1/36*
U.S. Cl. 128—420.6 6 Claims

1. A cochlear prosthesis comprising:
a transmitter part arranged to be carried by a user and comprising:
a sound-to-electrical signal transducer for deriving an electrical analog signal representative of incident acoustic signals in the audible frequency range;
sound processing means connected to said transducer for dividing the electrical analog signal into a plurality of component signals;
frequency modulating means connected to said sound processing means for deriving a plurality of frequency modulated signals each having a respectively different center

frequency and each frequency modulated with a respective component signal;

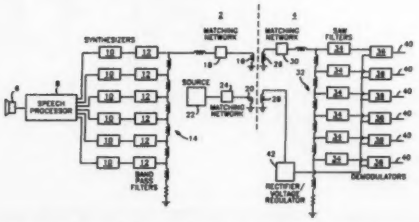
bandpass filter means composed of a plurality of first filter elements, each element being connected to receive a respective frequency modulated signal from said frequency modulating means and having a selected pass band centered on a respective center frequency of said frequency modulating means;

frequency multiplexing means connected to said filter means for combining the signals passed by all of said filter elements; and

transmitting antenna means connected to said frequency multiplexing means for emitting a radiation signal corresponding to the signals combined by said frequency multiplexing means; and

a receiver part arranged to be surgically implanted in the user's body and comprising:

receiving antenna means arranged to be positioned in proximity to said transmitting antenna means for converting



the radiation signal emitted by said transmitting antenna means into a received signal corresponding to the signals combined by said frequency multiplexing means;

frequency demultiplexing means including a plurality of second filter elements, said frequency demultiplexing means being connected to said receiving antenna means for causing each said second filter element to pass a respective portion of the received signal lying in a respective frequency band;

demodulator and amplifier means connected to said frequency demultiplexing means for individually demodulating and amplifying the signal portion passed by each said second filter element; and

a plurality of output electrodes each arranged to be implanted at a selected location in a cochlea of the user and each connected to said amplifier means for receiving a respective individually amplified received signal portion,

wherein said first filter elements are surface acoustic wave filters.

5,069,211

MICROPROCESSOR CONTROLLED ELECTRONIC STIMULATING DEVICE HAVING BIPHASIC PULSE OUTPUT

James T. Bartelt, Longmont; Frank W. Harris, Boulder, and Alan R. Owens, Longmont, all of Colo., assignors to Staodyn, Inc., Longmont, Colo.

Filed Aug. 25, 1989, Ser. No. 398,738
Int. Cl.[5] A61N *1/08*
U.S. Cl. 128—421 **20 Claims**

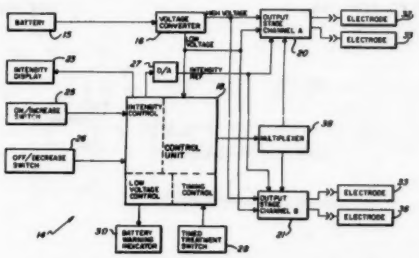
1. A microprocessor-controlled electronic stimulating device, comprising:

power supply means for supplying a high voltage output;

microprocessor means for supplying timewise spaced control pulses;

biphasic pulse generating means connected with said power supply means and said microprocessor means, and responsive to receipt of said high voltage output and said control pulses, providing a biphasic pulse output suitable for enabling both of first and second electrodes separately receiving said biphasic pulse output to be active; and

output means connected with said biphasic pulse generating means, said output means providing first and second outputs each of which is adapted to be connected with different ones of first and second electrodes to be made active, said output means including capacitance means enabling said biphasic pulse output to be capacitively coupled from said device to said first and second electrodes, and said output means also including discharge circuit means con-



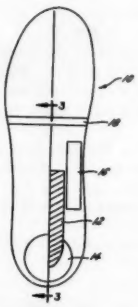
nected with said capacitance means with said discharge circuit means being configured such that said capacitance means is discharged after coupling of said biphasic pulse output therethrough in a manner such that said first and second electrodes are both made active, and said microprocessor means providing automatic intensity control of said biphasic pulse output.

5,069,212

BIOMECHANICAL ORTHOTIC WITH CONVERTIBLE INSERTS

Lee S. Cohen, Bryn Mawr, Pa., assignor to The Dr. Cohen Group, Inc.,

Filed Jul. 17, 1989, Ser. No. 380,590
Int. Cl.[5] A61F *5/14*
U.S. Cl. 128—615 **4 Claims**



1. An orthotic insert, comprising:

a pad formed of thermoset polymeric foam and being compressible and resilient, said pad being dimensioned to underlie the plantar surface of the foot and incorporating antipronation means including a forefoot varus wedge, an arch support and a heel cup, said pad having a plantar and lower surfaces and defining an aperture interrupting the continuity of and formed in said plantar surface, said aperture being medially disposed of the pad's longitudinal bisector and extending through the pad region operative to underlie an ankle, and

insert means for progressive alteration of the biomechanical function of the pad relative to the forefoot, and insert means conforming to the dimensions of said aperture to

form the portion of said plantar surface corresponding to said aperture and having selected density and compressibility characteristics for modifying the degree of biomechanical functional alteration of the orthotic.

5,069,213

OXIMETER SENSOR ASSEMBLY WITH INTEGRAL CABLE AND ENCODER

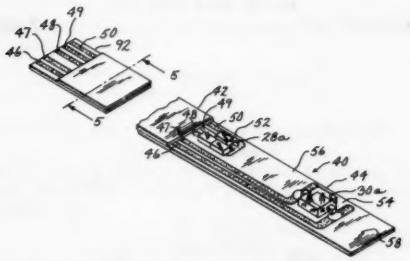
Mark H. Polczynski, Elm Grove, Wis., assignor to Thor Technology Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 188,217, Apr. 29, 1988, Pat. No. 4,964,408. This application Dec. 19, 1989, Ser. No. 452,719

The portion of the term of this patent subsequent to Oct. 23, 2007, has been disclaimed.

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—633 **10 Claims**



1. An oximeter sensor assembly with integral cable comprising:

a thin elongated flexible sheet-like electrically insulating substrate strip having an integral end portion capable of flexibly wrapping at least partially around a human body part;

a plurality of primary electrical conductors on said substrate strip;

a light emitting electrical component and a light receiving electrical component mounted on said substrate strip at said end portion and electrically connected to respective said primary conductors, said light emitting electrical component emitting light capable of passing through a human body part, said light receiving electrical component receiving said light;

encoding means on said substrate strip providing signals to the oximeter indicative of the known wavelength of said light emitting electrical component, said encoding means comprising a pair of auxiliary electrical conductors on said substrate strip and means for varying electrical conductivity therebetween comprising thin film resistive material deposited on said substrate between said auxiliary conductors;

thin elongated sheet-like electrically insulating film means on said substrate strip covering said primary conductors and said encoding means.

5,069,214

FLASH REFLECTANCE OXIMETER

George M. Samaras, Columbia, Md.; Steven M. Falk, Washington, D.C., and Otis R. Blaumanis, Sparks, Md., assignors to GMS Engineering Corporation, Columbia, Md.

Filed Dec. 14, 1988, Ser. No. 284,496

Int. Cl.[5] A61B *5/14*

U.S. Cl. 128—633 **3 Claims**

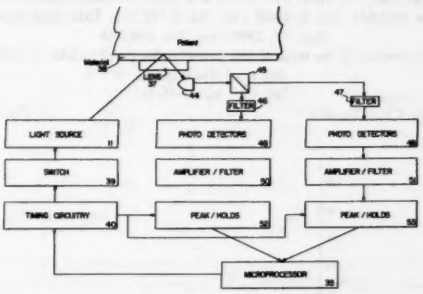
1. A method of determining the oxygenation of a tissue sample by use of an apparatus having:

a means for producing light of an intensity capable of penetrating clothing adjacent the tissue sample, such that the light is reflected by the tissue sample back through the clothing; and

a means for responding to the reflected light and for producing an output signal related to the oxygenation of the tissue sample; the steps comprising:

placing said apparatus adjacent clothing covering the tissue of a patient;

producing light by operation of said means for producing light in a plurality of pulses such that the light penetrates the clothing of the patient and is reflected by the tissue back through the clothing; and



sensing the reflected light by operation of said means for responding and producing an output signal related to the oxygenation of the tissue; and

further comprising the step of determining the oxygenation of the tissue by comparing differences in the output signal corresponding to different pulses of produced light.

5,069,215

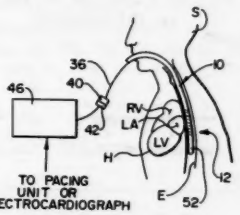
MULTIPLE ELECTRODE AFFIXABLE SHEET

Hossein Jadvar, Chicago, and William T. Metzger, Libertyville, both of Ill., assignors to Arzco Medical Electronics, Inc., Vernon Hills, Ill.

Filed Feb. 6, 1989, Ser. No. 306,997

Int. Cl.[5] A61B *5/0402, 8/12;* **A61N** *1/05*

U.S. Cl. 128—642 **32 Claims**



1. A multi-element electrode structure removably affixable to an essentially cylindrical esophageal probe which can then be inserted into the esophagus of a patient, the electrode structure comprising:

a rectangular insulative sheet member having a selected length dimension and a width dimension corresponding to the perimeter of the esophageal probe;

a plurality of spaced electrodes carried by said sheet member;

adhesive means carried by said sheet member for removably affixing said member to the probe; and

a plurality of elongated conducting members with each said conducting member having an end in electrical contact with a respective one of said electrodes.

5,069,216

SILANIZED BIODEGRADABLE SUPER PARAMAGNETIC METAL OXIDES AS CONTRAST AGENTS FOR IMAGING THE GASTROINTESTINAL TRACT

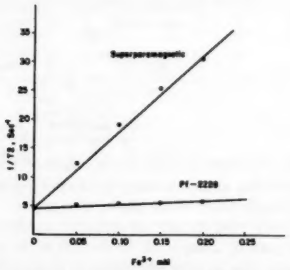
Ernest V. Groman, Brookline; Lee Josephson, Arlington, and Jerome M. Lewis, Newton, all of Mass., assignors to Advanced Magnetics Inc., Cambridge, Mass.

Continuation of Ser. No. 244,432, Sep. 14, 1988, Pat. No. 4,951,675, which is a continuation of Ser. No. 67,586, Jun. 26, 1987, Pat. No. 4,827,945, which is a continuation-in-part of Ser. No. 882,044, Jul. 3, 1986, Pat. No. 4,770,183. This application Sep. 19, 1989, Ser. No. 409,384

The portion of the term of this patent subsequent to May 9, 2006, has been disclaimed.

Int. Cl.[5] A61K *49/00*

U.S. Cl. 128—653.4 **23 Claims**



1. A method for obtaining an in vivo MR image of at least a portion of the gastrointestinal tract of an animal or human subject which comprises (a) administering enterally to such a subject an effective amount of a contrast agent in a physiologically acceptable carrier, which contrast agent comprises silanized aggregates of biodegradable superparamagnetic metal oxide crystals, said aggregates having an overall mean diameter of about 4000 angstroms or less as measured by light scattering; and (b) obtaining such MR image.

5,069,217

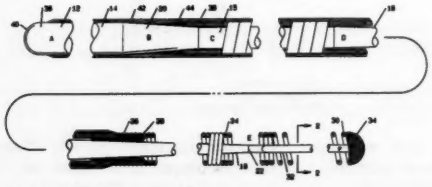
STEERABLE GUIDE WIRE

Joseph F. Fleischhacker, Jr., Mound, Minn., assignor to Lake Region Manufacturing Co., Inc., Chaska, Minn.

Filed Jul. 9, 1990, Ser. No. 549,740

Int. Cl.[5] A61B *6/00*

U.S. Cl. 128—657 **1 Claim**



1. A guidewire comprising:

a. a core wire of about 180 cm in length including in order a main diameter of about 0.012 to 0.018 inches of about 150 cm in length, a first taper of about 2 cm in length, an intermediate diameter of about 10–22 cm in length, a second taper of about 4–15 cm in length, and a final diameter of about 0.003 inches of about 2 cm in length flattened to about 0.002 inches by about 0.0045 inches;

b. a flat wire coil brazed to said first taper and said second taper and about said core wire; and,

c. a flexible coil spring of radiopaque material, of about 0.012 to 0.018 inches outside diameter to about 0.010 to 0.012 inches inside diameter, attached between a hemispherical weld tip and said flat wire coil brazed at said second taper and about said core wire, whereby said final diameter of said core wire and said flexible coil spring provide for insertion, flexibility and maneuvering of said guidewire with flexibility and bendability of a distal end.

5,069,218

FETUS MONITORING APPARATUS

Makoto Ikeda, Fuji, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

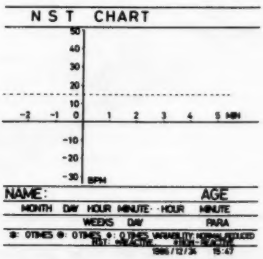
PCT No. PCT/JP88/00099, § 371 Date Jul. 31, 1989, § 102(e) Date Jul. 31, 1989

PCT Filed Feb. 3, 1988, Ser. No. 392,962

Claims priority, application Japan, Feb. 3, 1987, 62-14720; Feb. 3, 1987, 62-14721; Feb. 3, 1987, 62-22934; Feb. 3, 1987, 62-22935

Int. Cl.[5] A61B *5/02, 8/02*

U.S. Cl. 128—670 **5 Claims**



1. A fetus monitoring apparatus comprising:

a memory means for time orderly storing fetal pulse signals representative of a fetal continuous state and mother pulse signals representative of the continuous state of a mother;

time difference calculation means for calculating a difference between a time when a fetal pulse signal is present and a time when a mother pulse signal is present stored in said memory means, a time difference calculation being made each time either one of the fetal pulse signal and mother pulse signal stored is present;

pulse rate calculation means for calculating pulse rates of either one of the fetal and mother pulse signals stored in the memory means, each time when said time difference calculation means calculates the time difference; and

outputting means for correlatively and two-dimensionally outputting a visual output in a manner that the pulse rates calculated by the pulse rate calculation means is on one axis of the two-dimensional visual output, and the time differences calculated by the time difference calculation means are on another axis of the two-dimensional visual output.

5,069,219

SELF SNUGGING UNIVERSAL BLOOD PRESSURE CUFF

Stanley M. Knoblich, Everett, Wash., assignor to SpaceLabs, Inc., Redmond, Wash.

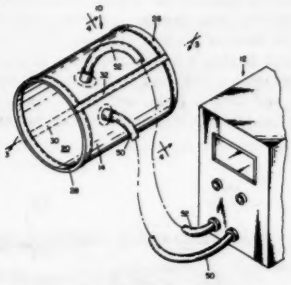
Filed Dec. 20, 1989, Ser. No. 454,025

Int. Cl.[5] A61B *5/022*

U.S. Cl. 128—679 **10 Claims**

1. A self-snugging, universal blood pressure cuff, comprising a fexible, substantially non-resilient cylindrical casing having a circumference that is substantially larger than the circumference of a patient's limb which it is adapted for use, said casing having an air-impermeable measurement bladder and an adjacent air-impermeable snugging bladder circumferentially spaced from said measurement bladder, said measurement

bladder and said snugging bladder being isolated from each other so that the pressure in said snugging bladder may be



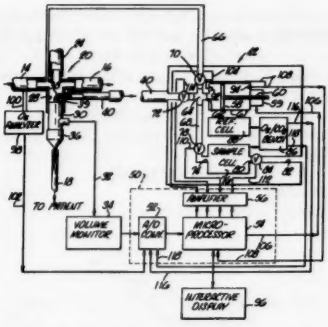
controlled independently from the pressure in said measurement bladder.

5,069,220

MEASUREMENT OF GAS CONCENTRATION IN EXHALED BREATH

James W. Casparie, Anaheim Hills, and Arieh S. Halpern, Riverside, both of Calif., assignors to Bear Medical Systems, Inc., Riverside, Calif.

Filed May 26, 1989, Ser. No. 357,469
Int. Cl.[5] A61B 5/083
U.S. Cl. 128—719 4 Claims



1. A method of measuring the concentration of a selected constituent gas in the exhaled breath of a patient, comprising the steps of:

(a) receiving an expiratory gas stream from the patient;

(b) measuring the flow rate of the expiratory gas stream and generating a flow rate signal;

(c) generating a tidal volume signal in response to the flow rate signal;

(d) generating a sample control signal in response to the tidal volume signal and the flow rate signal to mark an interval within the end tidal periods of several successive expiratory gas streams from the patient;

(e) extracting a sample of each of the several expiratory gas streams during the marked interval in response to the sample control signal;

(f) accumulating each extracted sample of the expiratory gas streams in a variable volume reservoir;

(g) transferring the accumulated gas samples within the variable volume reservoir into a sample cell in response to the variable volume reaching a predetermined limit; and

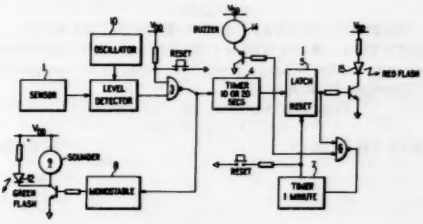
(h) measuring the concentration of the selected constituent gas in the volume of gas contained in the sample cell.

5,069,221

DISPLACEMENT SENSOR AND MEDICAL APPARATUS

Edmund S. Smith, and John Davies, both of North Wales, United Kingdom, assignors to Densa Limited, North Wales, United Kingdom

Continuation of Ser. No. 139,648, Dec. 30, 1987, abandoned.
This application Jun. 18, 1990, Ser. No. 540,314
Int. Cl.[5] A61B 5/08
U.S. Cl. 128—721 9 Claims



1. A displacement sensor for sensing the movement of a surface of a patient comprising: (a) a housing (1) formed at least in part of resilient material that defines a contact portion (13) that is configured and constructed to rest, when in use, in contact with the surface the movement of which is to be sensed; (6) a displacement transducer (28) including a Hall effect device (18) mounted in a normally spaced position adjacent said contact portion (13); (c) a magnetic activator (24) for said displacement transducer (28,18) mounted for movement with the constant portion (13) such that, when in use the surface the movement of which is to be detected does not move, the contact portion (13) moves, thus changing the spacing between the activator (24) and the Hall effect device thereby causing the Hall effect device to produce an output voltage; (d) a level detector means which receives the output of the Hall effect device and produces an output which varies therewith; (e) means for applying a dynamic reference voltage to the input of the level detector which varies with the output of the Hall effect device; (f) alarm means connected to respond to the output of the level detector for indicating movement of said surface.

5,069,222

RESPIRATION SENSOR SET

Lewis D. McDonald, Jr., 701-17th Ave., Seattle, Wash. 98122

Filed Aug. 31, 1990, Ser. No. 575,597
Int. Cl.[5] A16B 5/08
U.S. Cl. 128—724 15 Claims

8. A sensor, coupleable to a monitor, for sensing the respiration of an individual, said sensor comprising:

an elongate body;

first respiration-responsive means, projecting radially out-

ward from said body and exposable to the individual's respiration, for responding to said respiration;

second respiration-responsive means, projecting radially outward from said body and exposable to the individual's respiration, for responding to said respiration;

third respiration-responsive means, projecting radially outward from said body and exposable to the individual's respiration, for responding to said respiration; and

a connector coupled to said first, second, and third respiration-responsive means.

5,069,223

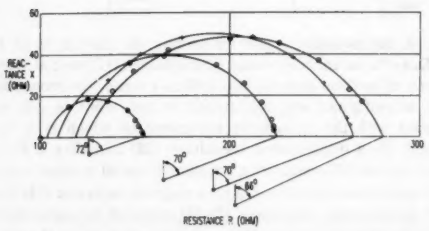
METHOD OF EVALUATING TISSUE CHANGES RESULTING FROM THERAPEUTIC HYPERTHERMIA

Donald A. McRae, Chevy Chase, Md., assignor to Georgetown University, Washington, D.C.

Filed Feb. 14, 1990, Ser. No. 480,050

Int. Cl.[5] A61B *5/05*

U.S. Cl. 128—734 **10 Claims**



1. A method of evaluating tissue changes in a mammal occurring as a result of applying a therapeutic hyperthermia treatment to a volume of tissue of said mammal, comprising:

a) placing electrodes on, near or into a volume of tissue to be monitored;

b) applying therapeutic hyperthermia to the volume of tissue desired to be heated;

c) measuring the electrical impedance of the volume of tissue to be monitored at least twice by means of the electrodes and by impedance measurement means in order to measure frequency dependent changes in the measured electrical impedance;

d) employing the frequency dependent changes in the measured electrical impedance to evaluate physiological and histological changes in the tissue cells, thereby measuring the nature and extent of the tissue changes; and

e) employing the measurements obtained from the tissue changes as a predictive assay of the progress of the hyperthermia treatment, thereby employing the same as an aid in adjusting the administration of the treatment, or determining a prognosis for each treatment, or ascertaining the desired stopping point for each treatment, or determining the need for further treatment or any combination of the above.

5,069,224

ENDOMETRIAL ASPIRATOR

Anthony Zinnanti, Jr., 13 Concho La., Bell Canyon, Calif. 91307

Continuation of Ser. No. 314,948, Feb. 24, 1989, abandoned, which is a continuation of Ser. No. 181,367, Apr. 14, 1988, abandoned. This application Jun. 8, 1990, Ser. No. 535,125

Int. Cl.[5] A61B *10/00*

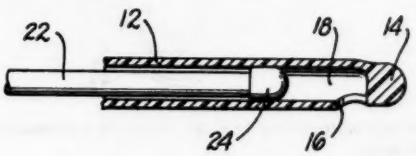
U.S. Cl. 128—752 **18 Claims**

1. An endometrial aspirator comprising:

a flexible tubular body having closed walls defining an interior passage of uniform diameter throughout a substantial portion of its length, said flexible tubular body having a proximal end and a tip end, a closure on said tip end to close the tubular body at said tip end;

walls defining a single sample opening aperture in the side of said body at said closure at said tip end, said single sample opening aperture being towards said proximal end of said body from said closure;

a flexible rod in said interior passage in said tubular body, said flexible rod being smaller in diameter than the diameter of said interior passage to freely slide therein, said flexible rod having a flexible piston at its tip end, said piston engaging within and sealing against said passage walls of said tubular body, said piston being without a cutting edge, said piston lying directly against said closure



at said closed tip end of said tubular body when in the forward position to substantially close said single sample opening aperture, said rod extending out of said proximal end of said tubular body so that said rod can be grasped to draw said piston through said tubular body to draw a vacuum in said body by withdrawal of said piston to draw a sample into said single sample opening aperture in the side of said tubular body so that the sample is drawn into said tubular body between said piston and said closure to retain the sample without cutting.

5,069,225

BLOOD COLLECTION AND/OR INJECTION DEVICE AND DOUBLE-ENDED MEDICAL NEEDLE AND HOLDER THEREFOR

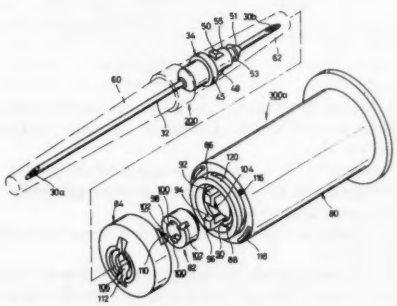
Toshio Okamura, Yamanashi, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1989, Ser. No. 412,183

Claims priority, application Japan, Sep. 28, 1988, 63-242684; Sep. 29, 1988, 63-245596

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—765 **13 Claims**



12. A holder for a medical needle having a cannula, and a hub fitted over the cannula, said hub having spreading teeth and a flange, said holder comprising:

an end defining a first opening, a portion of said cannula adapted to be inserted into said first opening with said hub held in said first opening by said holder;

an opposite end defining a second opening adapted to receive therein an evacuated blood collection tube or syringe;

hub support walls disposed around said first opening and including means for supporting a side wall of said hub;

flexible walls disposed around said first opening and sepa-

rated from said hub support walls by slits, said flexible walls being flexible at least at distal ends thereof;

chuck teeth disposed around said first opening and projecting radially inwardly from said distal ends of said flexible walls; and

a fastening ring axially slidably fitted over said hub support walls and said flexible walls; and

wherein when said portion of said cannula is inserted into said first opening until said flange of said hub is engaged and held against said hub support walls and thereafter said fastening ring is moved axially, said chuck teeth are flexed radially inwardly to engage said flange of said hub against dislodgement.

5,069,226

CATHETER GUIDEWIRE WITH PSEUDO ELASTIC SHAPE MEMORY ALLOY

Kiyoshi Yamauchi, Miyagi; Takahiro Kugo, and Yasuo Miyano, both of Shizuoka, all of Japan, assignors to Tokin Corporation, Sendai and Kabushiki Kaisha Terumo, Tokyo, both of, Japan

Filed Apr. 27, 1990, Ser. No. 515,591

Claims priority, application Japan, Apr. 28, 1989, 1-107855; Apr. 28, 1989, 1-107856; Apr. 28, 1989, 1-107857

Int. Cl.[5] A61B *5/00*

U.S. Cl. 128—772 **14 Claims**

1. A length of solid core wire for use in a catheter guide wire, said core wire/catheter guide wire together having particular use with a catheter:

said length of core wire comprising an end portion and a remainder portion extending therefrom,

said end portion comprising a Ni-Ti alloy characterized by pseudoelasticity at a temperature of about 37° C. and which exhibits plasticity at a temperature less than about 80° C.,

whereby said end portion can be readily deformed into a desired shape.

5,069,227

PROPHYLACTIC DEVICE HAVING PATHOGEN RESISTANT BARRIER

Hovaness Maronian, Rochester, N.Y., assignor to Rochester Medical Devices, Inc., Rochester, N.Y.

Continuation of Ser. No. 261,050, Oct. 21, 1988, abandoned. This application Nov. 20, 1990, Ser. No. 617,391

Int. Cl.[5] A61F *6/04*

U.S. Cl. 128—844 **20 Claims**

1. A prophylactic device having an improved barrier to resist the transmission of sexually transmitted virus, including those causing AIDS and HERPES comprising:

a hollow article having a continuous thin elastic membrane wall that is preshaped to anatomically conform to portions of the body and provide a physical barrier resisting the transmission of pathogens,

said thin elastic membrane wall being capable of cyclical elastic stretching and relaxing without normally experiencing a permanent set or fracturing or tearing of the membrane wall,

said membrane wall being characterized as comprising a matrix having submicroscopically small pores formed therein during manufacture, with said pores tending to enlarge during stretching of the membrane and to contract during relaxation of the membrane from its stretched condition,

a thin layer of ductile metal on an outer surface of the membrane wall for sealing the pores therein,

said ductile metal layer having an undulating surface when the membrane wall is in a relaxed state,

said metal layer's undulating surface being extended and progressively smoothed as the membrane is elastically expanded, without breaking or fracturing of the metal layer,

said metal layer improving the barrier resistance of the prophylactic member to the passage of pathogens therethrough, despite cyclically repeated elastic stretching and relaxing of the membrane.

5,069,228

CONDOM WITH PROXIMAL PUBIC SHIELD

Reuben Sorkin, 4721 University Dr., Coral Gables, Fla. 33146

Continuation-in-part of Ser. No. 93,933, Sep. 8, 1987, abandoned, and Ser. No. 110,152, Oct. 19, 1987, Pat. No. 4,856,534, and Ser. No. 148,724, Jan. 25, 1988, Pat. No. 4,808,174, and Ser. No. 327,796, Mar. 23, 1989, Pat. No. 4,955,392. This application Sep. 10, 1990, Ser. No. 579,904

Int. Cl.[5] A61F *5/44*

U.S. Cl. 128—844 **5 Claims**

1. A condom of thin pliable rubbery latex material comprising:

a sleeve having an open proximal end and a closed proximal end having a reduced diameter defining a reservoir, said sleeve being sized to receive and snugly jacket an erect penis,

a pubic shield integrally formed with said sleeve having a uniform thickness of the pliable rubbery latex material and extending radially away from the proximal end being structured and disposed to overlay the pubic area of a user during intercourse,

said shield having a surface adapted to confront the pubic area about the base of a penis of a user, and

adhesive means comprising a skin compatible glue formed from a co-polymer of an acrylic ester and acrylic acid, said adhesive means being disposed on the surface to adhere the shield to the pubic area of the user during intercourse.

5,069,229

METHOD AND APPARATUS FOR THE REDUCTION OF SOFT TISSUE INJURY IN A FEMORALLY CATHETERIZED PATIENT

Paul A. Kurth, 1423 Brett Pl., San Pedro, Calif. 90732

Filed Jan. 22, 1990, Ser. No. 468,199

Int. Cl.[5] A61F *5/37*

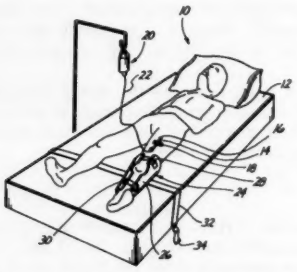
U.S. Cl. 128—877 **6 Claims**

1. A method for reducing soft tissue injury associated with implantation of an object in a femoral incision in a leg comprising the steps of:

implanting said object in said femoral incision; and

reducing hip movement of at least that portion of the hip adjacent to said femoral incision by immobilizing only the

knee portion corresponding to said leg to prevent flexure of said knee,



whereby soft tissue injury related to said implanted object within said femoral incision is substantially avoided.

5,069,230

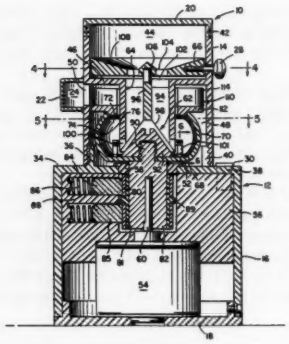
SMOKE GENERATING APPARATUS

William D. Green, 8906 Camden St., Alexandria, Va. 22308

Continuation-in-part of Ser. No. 588,363, Mar. 12, 1984, Pat. No. 4,580,583, which is a continuation-in-part of Ser. No. 251,074, Apr. 6, 1981, Pat. No. 4,436,100, and a continuation-in-part of Ser. No. 104,701, Dec. 17, 1979, Pat. No. 4,259,970. This application Apr. 7, 1986, Ser. No. 848,632

Int. Cl.[5] A24F *47/00*

U.S. Cl. 131—330 **35 Claims**



1. In a smoke generating apparatus, including a housing having an outlet opening formed therein, and a combustion chamber therebelow, infeed means for gravitationally conducting combustible material into the combustion chamber and a rotatable burner assembly, comprising a supporting wall spaced below the infeed means, an annular wall projecting upwardly from the supporting wall in enclosing relation to the combustion chamber, heat emitting means mounted on the annular wall internally of the combustion chamber for combustion of the material accumulated thereon and means responsive to rotation of the burner assembly for radially impelling the material fed into the combustion chamber toward the annular wall to accumulate the material on said heat emitting means.

5,069,231

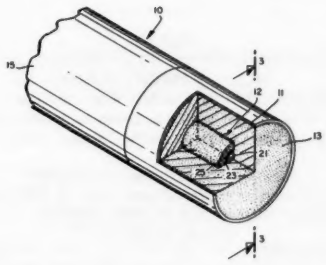
METHOD FOR IMPARTING FUNCTIONAL INGREDIENTS, FUNCTIONAL INGREDIENT-IMPARTING ARTICLES AND METHODS FOR PREPARATION AND USE THEREOF

Howard J. Rutherford, Highlands, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 379,175, Jul. 12, 1989. This application Sep. 14, 1989, Ser. No. 407,064

Int. Cl.[5] A24D *3/04, 1/00*

U.S. Cl. 131—335 **39 Claims**



1. An article capable of effecting controlled release of a functional material therefrom into the environment surrounding the article consisting of:

(a) a core or a plurality of cores consisting of the same or different releasable functional materials dispersed within a first polymeric substance;

(b) coated onto a substantial portion of the surface of the core or cores, a barrier polymer coating consisting of a second polymeric substance, the second polymeric substance having a permeability to the mass transport of functional material contained within the core or within one or more of the plurality of cores which is substantially less than the permeability of the first polymeric substance to the mass transport; and

(c) coated onto a substantial portion of the outer surface of the barrier polymer coating, a functional material-burst coating consisting of one or more of the same or different functional material dispersed within a third polymeric substance;

(i) a portion of the total surface area of the core or cores being directly in contact with the environment surrounding the article;

(ii) the average molecular weight of each of the functional being greater than about 100;

(iii) the totality of the outer surface of the functional material-burt coating being directly in contact with the environment surrounding the article; and

(iv) the functional materials in the core being the same as or different from the functional materials in the functional material-burst coating.

5,069,232

DISPOSABLE MAKE-UP SYSTEMS

Marcel J. H. Staar, Brussels, Belgium, assignor to Staar Development Company S.A., Brussels, Belgium

Continuation-in-part of Ser. No. 417,330, Oct. 5, 1989, abandoned. This application Oct. 5, 1990, Ser. No. 594,563

Claims priority, application Belgium, Oct. 5, 1988, 08801140

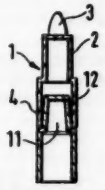
Int. Cl.[5] A45D *40/26*

U.S. Cl. 132—320 **18 Claims**

1. A conditioning system for very small doses of make-up, comprising:

a base part comprising a tubular portion of enlarged diameter and a guide portion, said guide portion having an applicator portion, with said make-up being deposited on said applicator portion; and

a cover part that is separable from and attachable to said base part for covering said applicator portion, and comprising a tubular portion, with said cover part being a combined cover and handle part that further comprises a reduced diameter portion having an outer diameter, with said



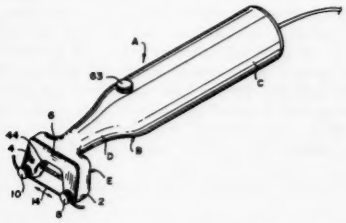
tubular portion of enlarged diameter having a cavity distal from said applicator portion, said cavity having an inner diameter that is adapted to receive said outer diameter of said reduced diameter portion of said combined cover and handle part.

5,069,233

METHOD AND APPARATUS FOR REMOVING DEBRIS FROM BETWEEN AND AROUND TEETH

Charles H. Ritter, 3219 Thomasville Rd.; #17A, Tallahassee, Fla. 32312

Filed Oct. 30, 1990, Ser. No. 605,441
Int. Cl.[5] A61C *15/00*
U.S. Cl. 132—322 **27 Claims**



1. An apparatus for removing debris from between and around teeth, comprising:

a) a housing having a handle and an operating head, said operating head including a pair of hollow tines;

b) flossing means operably associated with said operating head for removing debris from between and around teeth, said flossing means including a support member for supporting a flossing material to extend in a first direction between the pair of hollow tines and at least a portion of said support member being disposed in said hollow tines; and,

c) drive means operably associated with said flossing means for displacing said portion of said support member disposed in said housing in the first direction.

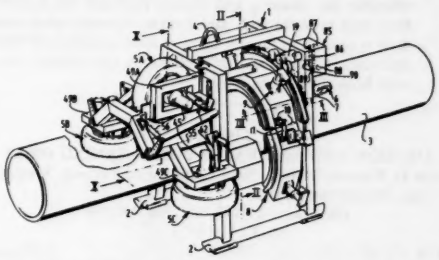
5,069,234

APPARATUS FOR TREATING AN EXTERIOR PIPE SURFACE

Anders G. Nielsen, Soest, Netherlands, assignor to Van Voskuilen-Woudenberg B.V., Woudenberg, Netherlands

Filed Nov. 30, 1990, Ser. No. 621,310
Claims priority, application Netherlands, Sep. 14, 1990, 9002031
Int. Cl.[5] B08B *3/02, 9/02*
U.S. Cl. 134—113 **5 Claims**

1. Apparatus for treating an exterior pipe surface, comprising a frame adapted for being mounted around the pipe to be treated; means therein for treating the pipe surface; and means in the form of travelling wheels for moving the frame in longitudinal direction along the pipe surface, characterised by means for detecting undesired displacements of the frame in



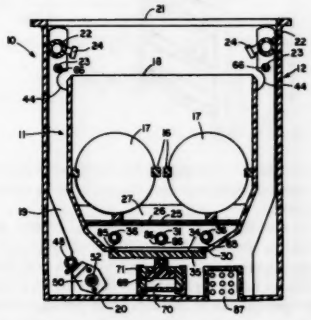
circumferential direction of the pipe, and control means for adjusting the wheel axes of one or more travelling wheels in angular position, in response to a signal delivered by the detection means.

5,069,235

APPARATUS FOR CLEANING AND RINSING WAFERS

William L. Vetter, American Fork, and Dennis L. Mortensen, Sandy, both of Utah, assignors to Bold Plastics, Inc., West Jordan, Utah

Filed Aug. 2, 1990, Ser. No. 561,778
Int. Cl.[5] B08B *3/04*
U.S. Cl. 134—113 **16 Claims**



1. An apparatus for cleaning and rinsing wafers used in the production of integrated circuits, said apparatus comprising:

a tank having a top edge and a bottom, said top edge forming an uninterrupted continuous weir about the entire circumference of said top edge, said bottom having a bottom opening formed therein covered by a door, said top edge forming an opening which is larger than said bottom opening, with said tank having a contour that decreases in cross sectional area from said top edge to said bottom, said tank further including a fluid inlet port formed therein adjacent to said bottom thereof,

means for positioning wafers to be cleaned and rinsed within said tank such that the top edges of the wafers are located below the top edge of said tank and the wafers are completely submerged within said tank,

control means functionally attached to said door for causing said door to move from a closed position in which said door is in adjacent contacting relationship with said bottom of said tank and completely covering said bottom opening therein and an open position which allows fluid flow through said bottom opening,

whereby, cleaning and rinsing fluid can enter through said

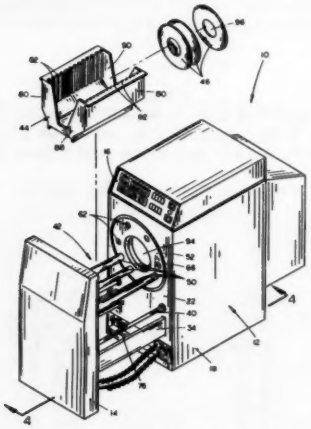
inlet port into said inner tank and pass upwardly over the wafers to clean and rinse said wafers, with the cleaning and rinsing fluid overflowing said weir edge in a cascading manner when said door is in its closed position, and whereby the cleaning and rinsing fluid can be dumped from said tank through said bottom opening when said door is opened to rapidly drain at least a portion of fluid contained in said tank for exchanging the drained fluid with fresh fluid in said tank.

5,069,236

METHOD AND APPARATUS FOR CLEANING DISKS

Eric D. Pierson, Lincoln, Nebr., assignor to Pathway Systems, Inc., Manhattan, Mont.

Filed Mar. 7, 1990, Ser. No. 490,139
Int. Cl.[5] B08B *3/02*
U.S. Cl. 134—153 **5 Claims**



1. An apparatus for cleaning disks, the disks being of the type having a central opening therethrough comprising: an enclosed housing;

a door in said housing operable between open and closed positions to permit access to the interior of said housing;

disk retaining means operably mounted in said housing and operable to rotate a plurality of disks about a longitudinal axis perpendicular to the disks and passing through their centers;

spray arm means mounted within said housing and projecting generally coaxial with the rotational axis of said disk retaining means for spraying fluid on said disks.

5,069,237

DISPOSABLE UMBRELLA

Michael L. Flanagan, 921 American Beauty Street, Orlando, Fla. 32818

Continuation-in-part of Ser. No. 482,636, Feb. 21, 1990, abandoned. This application Mar. 29, 1991, Ser. No. 677,311
Int. Cl.[5] A45B *13/00*
U.S. Cl. 135—19.5 **6 Claims**

1. An umbrella comprising:

a staff;

a fixed collar mounted to one end of said staff;

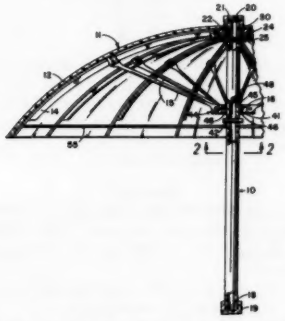
a plurality of main struts attached to said fixed collar and extending radially from said fixed collar, said plurality of main struts being movable from a collapsed position wherein said main struts extend generally parallel to said staff to an open position wherein said main struts extend outwardly from said staff;

a waterproof film fixed to said plurality of main struts and extending generally from said staff to the extending ends of said main struts;

a slidable collar having a bore therethrough and being slidably mounted to said staff;

a plurality of collapsing struts, said collapsing struts having an inner end pivoted to said slidable collar and an outer end pivoted to said main struts so that movement of said collar slidable along said staff towards said upper end of said staff causes said main struts to move out to an open position; and

latching means for selectively holding said slidable collar in a predetermined position on said staff to thereby hold said main struts in said open position, said latching means



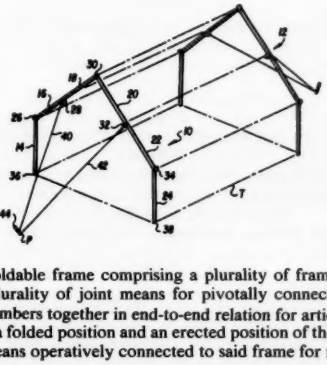
including a pair of pins mounted through said staff and substantially perpendicular to said staff in a predetermined spaced relationship to each other and said latching means also including said slidable collar having a pair of grooves along said bore walls parallel to the axis of said staff and each groove being spaced about 180 degrees from the other and each groove sized to fit over one said pin extending from said staff, and to be stopped by the other said latching pin on said staff, whereby said slidable collar can slide along said staff past said one said latch pin while being blocked by a second said latch pin and rotated to prevent said latching collar from sliding past said one latch pin.

5,069,238

PIVOTABLE JOINT AND JOINT LOCKING MECHANISM FOR A FOLDABLE FRAME

Lloyd A. Marks, 727 Great Springs Rd., Bryn Mawr, Pa. 19010

Filed Oct. 4, 1990, Ser. No. 592,815
Int. Cl.[5] E04H *15/48*
U.S. Cl. 135—109 **20 Claims**



1. A foldable frame comprising a plurality of frame members, a plurality of joint means for pivotally connecting the frame members together in end-to-end relation for articulation between a folded position and an erected position of the frame, tensile means operatively connected to said frame for rigidify-

ing said joint means in the erected position of the frame, said tensile means comprising a longitudinally elastic tensile member and releasable locking means cooperating with each of said joint means for rigidly locking said joint means against articulation in at least the erected position of said frame, said locking means for each joint means comprising a one-piece locking member all parts of which are spaced from the pivot axis of the pivotable joint means associated therewith.

5,069,239

FLUID CONTROL METHOD AND DEVICE

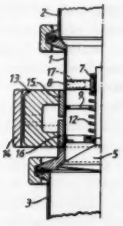
Kevin R. Bunce, Baldock, England, and Tore Sorby, Hokksund, Norway, assignors to Elopak Systems A.G., Switzerland

Continuation-in-part of Ser. No. 301,234, Jan. 24, 1989, abandoned. This application May 10, 1991, Ser. No. 708,772

Claims priority, application United Kingdom, Jan. 26, 1988, 8801665

Int. Cl.[5] F16K *15/18*; B08B *9/03*

U.S. Cl. 137—15 **28 Claims**



1. A method of utilizing ducting containing a non-return valve including biassing means biassing a valve closure member of said valve into a closed position, comprising forcing said valve closure member out of said closed position to an open position against the action of said biassing means by pressing production fluid in said ducting against said valve closure member, whereby said production fluid flows through the open valve; operating magnetic means disposed externally of said ducting to maintain said closure member in an open position against the action of said biassing means; and passing a cleaning fluid through said ducting and the open valve while said magnetic means maintains said closure member in the latter position.

5,069,240

FLEXIBLE SEATING STRUCTURE FOR ROTARY VALVES

Gregory A. Kurkjian, Jr., Wheaton, Ill., assignor to Henry Pratt Company, Aurora, Ill.

Filed Dec. 12, 1990, Ser. No. 626,195

Int. Cl.[5] F16K *43/00, 5/20, 25/00*

U.S. Cl. 137—15 **17 Claims**

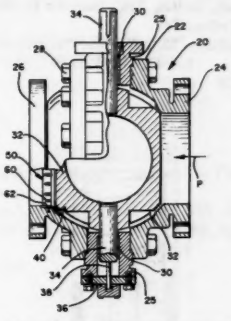
14. The method of providing a watertight seal for a rotary valve having a valve body, and a rotatable closure member for closing off a fluid passage through the valve body, comprising the steps of:

providing a sealing seat to one of the valve body and the rotatable closure member;

loosely mounting a flexible seating ring formed of a relatively thin material to the other of said valve body and said rotatable closure member with adjustable mounting members, such that said flexible seating ring presents a flexible seating surface to said sealing seat during valve closure;

positioning a resilient bias member between said flexible seating ring and said other of said valve body and said closure member to bias said flexible seating ring against said sealing seat when said closure member is initially closed, thereby permitting proper centered positioning of said flexible seating ring relative to said sealing seat during assembly of said rotary valve, as well as thereafter providing continuous biasing of said flexible seating ring during normal valve closure;

closing said closure member during assembly of said rotary



valve such that said flexible seating ring finds its proper sealing position with said sealing seat; and

firmly securing said adjustable mounting members whereby said flexible seating ring is firmly secured in said proper centered sealing position.

5,069,241

CHANGE-OVER VALVE WITH AUTOMATIC RESETTING

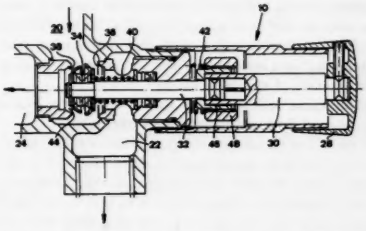
Ferdinand Hochstrasser, Auenstein, Switzerland, assignor to KWC AG, Hauptstrasse, Switzerland

Filed Apr. 5, 1991, Ser. No. 681,327

Claims priority, application Switzerland, Apr. 6, 1990, 01179/90

Int. Cl.[5] F16K *11/044*

U.S. Cl. 137—119 **12 Claims**



1. A change-over valve with automatic resetting, for changing over a flowing medium delivered via an inflow supply from a first outlet to a second outlet, comprising:

a housing;

a valve member arranged in said housing and having two end positions and an inoperative position;

an actuating element;

two valve seats associated to said first and second outlets, respectively;

said flowing medium causing an impact pressure;

said valve member being movable by reciprocation of said actuating element between said two valve seats and being held by said impact pressure, as the case may be, in one of said two end positions co-operating with said two valve seats, respectively;

means for resetting said valve member to said inoperative position in the absence of said impact pressure; and

said resetting means being adjusted to set said inoperative position such that said valve member assumes a position

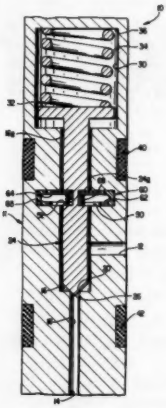
arranged in spaced relationship with respect to both said valve seats.

5,069,242

GAS LIFT VALVE UTILIZING A DIAPHRAGM PILOT

Marion D. Kilgore, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Jan. 25, 1991, Ser. No. 645,699
Int. Cl.[5] F04F *1/20*
U.S. Cl. 137—155 **17 Claims**



1. A gas lift valve for use in a gas lift well having a well tubing, comprising:

(a) body means having a flow passage therethrough having inlet means at one end thereof and outlet means at the other end thereof, said inlet means including first and second spaced apart inlet openings;

(b) means on said body for attachment to means for securing the same in said well tubing such that said outlet means is in fluid communication with the interior of said well tubing and said inlet means is in fluid communication with the exterior of said well tubing;

(c) main valve seat means in said body means located between said first and second inlet openings;

(d) main valve means including an annular main valve member in said body means having a bore therethrough and a seat surface thereon and being movable between a first closed position of engagement of its seat surface with said main valve seat means for preventing fluid flow through its bore and a second open position wherein said main valve member is spaced from said main valve seat for permitting fluid flow therethrough;

(e) means biasing said annular main valve member toward said first closed position; and

(f) pilot valve means for moving said annular main valve toward said second open position, said pilot valve means comprising:

(i) pilot seat means above said main valve seat communicating with said second inlet opening,

(ii) pilot valve member means including a pilot valve member having a stem with a seating surface thereon and movable between a first closed position of engagement with said pilot seat means to close the same, and a second open position, said pilot valve stem being formed with an external annular recess,

(iii) piston/cylinder means including a cylinder between said pilot seat and said main valve seat, and a piston slidable in said cylinder between an extended position in which it holds said main valve open and a retracted position in which it permits said main valve to return to said closed position, and

(iv) diaphragm means sealingly engaged both with said stem and said body means, said diaphragm means having its lower side exposed to pressure admitted thereto through said second inlet and its upper side exposed to atmospheric pressure,

(v) means biasing said pilot valve toward said closed position,

(vi) whereby, when fluid pressure admitted through said second inlet and acting upon the lower side of said diaphragm reaches a predetermined value the pilot valve means will be lifted off its seat to admit fluid pressure into said cylinder to move said piston down to move said main valve from its closed to its open position, and whereby when the pressure admitted through said second inlet falls below said predetermined pressure, said biasing means will return said pilot valve member to its closed position and permit said main valve to return to its closed position;

(g) said body means being formed with an internal annular recess having its upper wall substantially aligned with the upper wall of said stem recess, said diaphragm having its outer edge portion sealingly disposed in said internal annular recess of said body while its inner edge portion extends inwardly into said external recess of said stem and sealingly engages the upper wall thereof; and

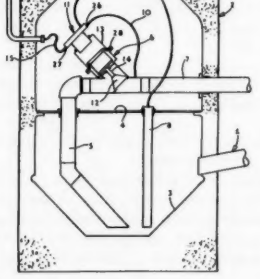
(h) biasing means in said external annular recess of said pilot valve stem for forcing said inner edge of said diaphragm upwardly into firm sealing contact with said pilot valve stem, and check valve means is disposed in said flow passage of said body between said inlet and said outlet means for preventing backflow therethrough.

5,069,243

LIQUID LEVEL CONTROL SYSTEM

Brain E. Foreman, Norwich, United Kingdom, assignor to Euro Iseki Limited, England

PCT No. PCT/GB89/00107, § 371 Date Nov. 30, 1989, § 102(e) Date Nov. 30, 1989, PCT Pub. No. WO89/07293, PCT Pub. Date Aug. 10, 1989
PCT Filed Feb. 3, 1989, Ser. No. 411,507
Claims priority, application United Kingdom, Feb. 4, 1988, 8802562; Aug. 31, 1988, 8820614
Int. Cl.[5] E03F *1/00*; B65G *53/00*; F16K *31/126*
U.S. Cl. 137—205 **20 Claims**



1. A valve control system for use in a temporary liquid storage and transportation system having a tank with a liquid inlet and an outlet connected to a vacuum source for withdrawal of liquid through an interface valve operable to be opened by air pressure produced when the liquid in the tank reaches a predetermined level therein,

said control system including pressure responsive means comprising

first and second chambers containing a first diaphragm disposed therebetween,

an inlet port above said first diaphragm in said first chamber for connection to said air pressure produced when the liquid in said tank reaches a predetermined level therein,

a bleed port from said first chamber to said second chamber,

third and fourth chambers containing a second diaphragm disposed therebetween and spaced from said first and second chambers,

said second diaphragm being operatively connected to actuate said interface valve to control flow through said tank outlet,

a passageway from said second to said third chamber for passage of air therebetween,

valve means operated by said first diaphragm to control flow through said passageway to control operation of said second diaphragm,

said system being operable upon application of a substantially constant predetermined pressure through said inlet port to allow flow of air through said bleed port to apply pressure to and move said second diaphragm to actuate said interface valve, and

on occurence of a surge of pressure into said inlet valve to move said valve means to close said passageway to prevent application of pressure to said second diaphragm and thus prevent operation of said interface valve.

5,069,244

LIQUID SOURCE CONTAINER DEVICE

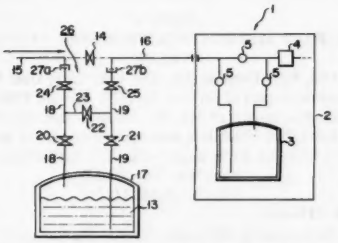
Shinji Miyazaki, Yokohama, and Yoshitaka Tsunashima, Tokyo, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 28, 1990, Ser. No. 635,655

Claims priority, application Japan, Jan. 11, 1990, 2-4337

Int. Cl.[5] F17C *13/00*

U.S. Cl. 137—209 **7 Claims**



1. A liquid source container device for supplying a source liquid to a material tank, the liquid source container comprising:

a main body for containing the source liquid;

a gas supply line having a first end connected to said main body for introducing a supply gas to the main body to exert a pressure on the source liquid;

a first joint provided at a second end of the gas supply line opposite the first end for coupling the gas supply line to the material tank;

first and second gas supply valves provided on the gas supply line between the first and second ends of the gas supply line;

a source liquid delivery line having a first end connected to said main body for transferring the source liquid therefrom in response to the pressure exerted on the source liquid;

a second joint provided at a second end of the source liquid delivery line opposite the first end for coupling the source liquid delivery line to the material tank;

first and second source liquid delivery valves provided on the source liquid delivery line between the first and second ends of the source liquid delivery line;

a purge line having a first end connected to the gas supply line between the first and second gas supply valves, and a second end connected to the source liquid delivery line between the first and second source liquid delivery valves; and

a purge valve provided on the purge line between the first and second ends of said purge line.

5,069,245

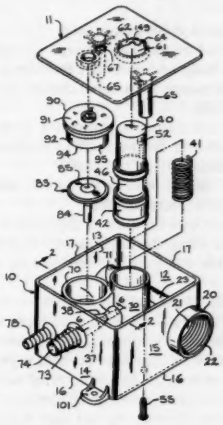
MIXING VALVE

Terry C. Potter, Sylvania, Ohio, assignor to Tolco Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 467,639, Jan. 19, 1990, abandoned. This application May 29, 1990, Ser. No. 529,532

Int. Cl.[5] B01F *5/04*

U.S. Cl. 137—218 **33 Claims**



1. A valve for mixing two liquids in specific proportions comprising:

(a) a first chamber;

(b) a first inlet means for introducing a first liquid into said first chamber;

(c) an outlet passageway for receiving liquid from said first chamber, said outlet passageway having a plurality of sections including a first section of predetermined size adjacent the first chamber, a second section extending from and flaring outwardly from said first section to a size larger than said predetermined size;

(d) means for controlling the flow of said first liquid from said first chamber to said outlet passageway;

(e) means for venting said outlet passageway when the means for controlling the flow of said first liquid from said first chamber to said outlet passageway is positioned to prevent such flow;

(f) a second chamber;

(g) a second inlet means for introducing a second liquid into said second chamber;

(h) an opening communicating between said second chamber and said outwardly flaring second section;

(i) means for controlling the flow of said second liquid from said second chamber to said outwardly flaring second section; and

(j) an outlet communicating with the outwardly flaring second section for discharging the mixed first and second liquids.

5,069,246

FLUID CONTROL VALVE AND ACTUATOR THEREFOR

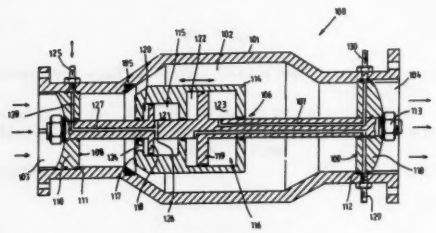
Andries M. Booyens, 75 Tarentaal Avenue, Ninapark Extension 3, Akasia, Transvaal Province, South Africa

Filed Sep. 1, 1989, Ser. No. 402,699

Claims priority, application South Africa, Sep. 2, 1988, 88/6534; Nov. 22, 1988, 88/8731

Int. Cl.[5] F16K *31/12*

U.S. Cl. 137—219 9 Claims



8. A fluid control valve comprising:

a valve body defining a flow passage extending between an inlet to the body and an outlet therefrom;

a seat and an actuator for a valve closure member located in the valve body;

the actuator comprising a stationary shaft and a hollow member mounted on the shaft to reciprocate relative to the longitudinal axis of the shaft;

a region of an outside wall of the hollow member constituting the valve closure member;

a stationary partition for each of the cavities mounted on the shaft and dividing the cavities into first and second fluid tight, variable volume chambers, one on either side of the partition;

an internal wall of the hollow member bordering a chamber in the first cavity and which wall faces the region of the hollow member constituting the closure member, being smaller in surface area than the said region, and the combined surface area of the said internal wall and an internal wall of the hollow member bordering a chamber in the second cavity also facing the said region being at least equal to the surface area of the region; and

the chambers communicating with control ports so that the pressure of a fluid in the chambers may be varied so that differences in pressure and surface area may be utilized to cause the hollow member to move between first and second positions on the shaft, thereby, in use, to move the region of the hollow member between an open position wherein it is spaced from the seat and a closed position wherein it is in sealing engagement with the seat.

5,069,247

CONDENSATE DRAIN WITH MONITOR DEVICE

Werner Föller, Stuhr, and Günter Herbold, Bremen, both of Fed. Rep. of Germany, assignors to GESTRA Aktiengesellschaft, Bremen, Fed. Rep. of Germany

Filed Jan. 3, 1991, Ser. No. 637,168

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1990, 4001152

Int. Cl.[5] F16K *37/00*

U.S. Cl. 137—558 12 Claims

1. A condensate drain comprising:

a housing having an entry channel and an exit channel;

a control chamber connected to said housing;

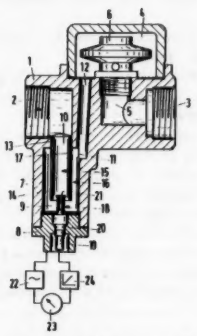
a drain device located in the control chamber, for controlling the flow of condensate;

a testing chamber having a bottom base part and having an upper part with a feed opening in said upper part and an outflow opening in said upper part;

the testing chamber being arranged laterally adjacent to the entry channel and essentially extending perpendicular to it;

a housing bore which forms the feed opening leading from the entry channel into the testing chamber;

a guide wall extending downwardly into the testing chamber, which guide wall dividing the testing chamber into a first chamber segment adjacent to the feed opening and a second chamber segment adjacent to the outflow opening, with the first and second chamber segments being connected with each other in the bottom part of the testing chamber;



a pipe which extends essentially perpendicular to the entry channel being provided, and which projects from the housing bore into the testing chamber as the guide wall;

said outflow opening of the testing chamber being located outside of the pipe;

a level sensor having a sensor area which is located in the bottom part of the testing chamber; and

a connecting channel extending from the outflow opening of the testing chamber to the control chamber.

5,069,248

COMPACT MULTI-STAGE PRESSURE REDUCING VALVE

Ajit S. Gill, 4169 Bennion Rd., Salt Lake City, Utah 84119

Continuation-in-part of Ser. No. 511,579, Apr. 20, 1990, which is a continuation-in-part of Ser. No. 340,898, Apr. 19, 1989, Pat. No. 4,967,793, which is a continuation-in-part of Ser. No. 167,861, Mar. 14, 1988, abandoned. This application Oct. 26, 1990, Ser. No. 604,679

Int. Cl.[5] F16K *31/145*

U.S. Cl. 137—613 35 Claims

1. A flow control and pressure reducing valve, comprising:

a lower valve body having an inlet opening and an outlet opening;

means preventing communication between the inlet opening and outlet opening through the lower valve body;

an upper valve body secured to the lower valve body and having an inlet chamber and an outlet chamber therein, said inlet chamber being in flow communication with the inlet opening of the lower valve body and the outlet chamber being in flow communication with the outlet opening of the lower valve body;

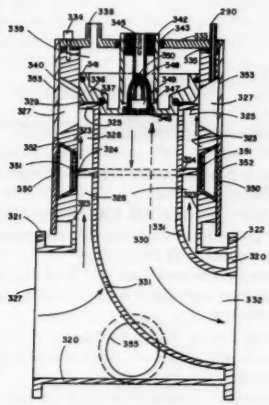
a partition means within the upper valve body separating the inlet chamber and outlet chamber;

a plurality of tapered receptacles extending through the upper valve body each having a relatively small inner end which opens to the inlet chamber, the partition means, and the outlet chamber, and a relatively large outer end opening to outside the upper valve body in an access opening, whereby flow control means can be placed in each receptacle from outside the upper valve body through said access opening, and whereby the receptacles each form a passage means extending through the upper valve body

from the inlet chamber to the outlet chamber around the partition means;

elastomeric flow control means located in each of said receptacle means and responsive to pressurized fluid introduced into said flow control means for controllably restricting each of said passage means to thereby control flow of fluid through the valve; and

means for covering and sealing said access openings.



5,069,249

SANITARY FITTING

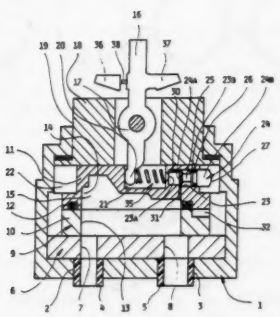
Ulrich K. Ostertag, and Reinhard F. Ostertag, both of Stuttgart, Fed. Rep. of Germany, assignors to Hansa Metallwerke AG, Stuttgart, Fed. Rep. of Germany

Filed Dec. 4, 1990, Ser. No. 621,894

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1989, 3940864

Int. Cl.[5] F16K *11/065*

U.S. Cl. 137—625.4 **7 Claims**



1. A sanitary fitting that includes

(a) at least one closing component which can be moved to vary the quantity of water flowing,

(b) a handle which is connected by a power transmission path to a closing component,

(c) a stop which limits the movement of the handle, and

(d) a brake which applies a force to limit excessively fast movements of the closing component,

characterized in that:

(e) a spring component (**35**) is included in the power transmission path (**16, 20, 21**) between the stop (**18, 36**) and the closing component (**9**) which applies the force to the closing component (**9**) in the direction of closing.

5,069,250

ROTARY VALVE FOR POWER STEERING APPARATUS

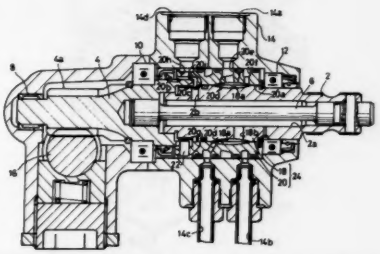
Yasuyoshi Emori, and Yukimitsu Ninamibata, both of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Sep. 12, 1990, Ser. No. 581,281

Claims priority, application Japan, Sep. 20, 1989, 1-109850

Int. Cl.[5] F15B *13/02;* **F16K** *11/076*

U.S. Cl. 137—625.23 **5 Claims**



1. A rotary valve for a power steering apparatus, comprising:

an input shaft which is turned in response to an operation of a steerable wheel, an output shaft disposed in axial alignment with said input shaft and rotatable relative thereto, a valve rotor disposed on said input shaft, and a hollow valve sleeve disposed in surrounding relationship with said valve rotor and connected to said output shaft for integral rotation therewith, an internal surface of said hollow valve sleeve being divided into sections of an increased and a reduced internal diameter section with a step defined therebetween, said input shaft being fitted into said hollow valve sleeve toward said step, means defining a plurality of return oil paths formed in said input shaft and said hollow valve sleeve for providing a communication between an axial portion of said input shaft and an outer surface of said hollow valve sleeve, wherein said return oil paths on said hollow valve sleeve include a plurality of circumferentially spaced recesses in said increased internal diameter section and said step, whereby a plurality of return flow grooves are formed between an axially facing end of said hollow valve sleeve, which end has said increased internal diameter section therein, and a mutually adjacent end of said output shaft, each groove extending from a radially inner portion of each of said return oil paths to a portion of said return oil paths disposed along said step and a radial exterior of said output shaft.

5,069,251

FRICTIONLESS PLATE VALVE

Gerald P. Dyer, Enfield, and Brian G. Donnelly, Suffield, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 372,796, Jun. 28, 1989, abandoned. This application Oct. 25, 1990, Ser. No. 604,385

Int. Cl.[5] F15B *13/04*

U.S. Cl. 137—625.25 **13 Claims**

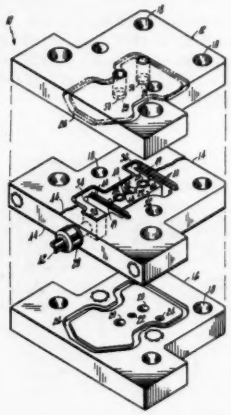
1. A plate valve comprising:

a plate having a first and second side and a given thickness;

a valve element, disposed within said plate, for stroking to meter a fluid flow into said element, said element having a first and second side and having a lesser thickness than said plate, a supply passage passing through said element, at least one metering stop disposed within said element, and a first metering groove disposed within said first side

of said element, said metering groove extending from said passage to said stop; and

a flexure, for attaching said plate to said element by providing a first attachment between said flexure and said element and by providing a second attachment between said flexure and said plate, wherein a direction from said first attachment to said second attachment is substantially perpendicular to a direction of said fluid flow.



5,069,252

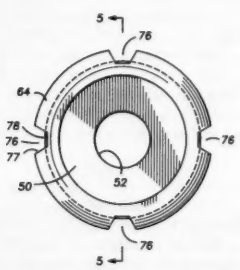
ORIFICE SYSTEM INTERMEDIATE INTERFACE

Ray Kendrick, Katy, and Gary Tatum, Houston, both of Tex., assignors to Daniel Industries, Inc., Houston, Tex.

Filed Dec. 18, 1990, Ser. No. 629,150

Int. Cl.[5] F15D *1/02*

U.S. Cl. 138—44 **21 Claims**



1. An orifice system for use with an orifice plate carrier, comprising:

an orifice plate having an outer circumference;

seal means for engaging said outer circumference of said orifice plate, said seal means including an outer sealing surface;

said seal means having an outer circumferential end surface having reliefs therein to expose portions of said outer circumference of said orifice plate; and

an intermediate interface located in said reliefs and abutting at least some of said exposed portions of said outer circumference of said orifice plate.

5,069,253

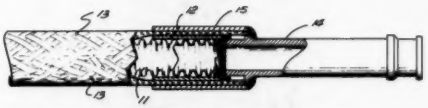
FLEXIBLE HOSE ASSEMBLY

Benjamin H. Hadley, 692 W. 9th St., Claremont, Calif. 91711

Filed Jan. 8, 1990, Ser. No. 461,820

Int. Cl.[5] F16L *9/18, 9/00*

U.S. Cl. 138—109 **4 Claims**



1. In a flexible hose assembly for a mercury line for a manometer, the combination of:

a length of convoluted helical hose having a hose end comprising a plurality of convolutions compressed together axially in contact with each other;

an inner sleeve positioned over said hose and hose end and having an inner sleeve end welded to said hose end at the free end thereof;

a hose fitting having a fitting end and a welding section spaced from said fitting end, with said fitting end welded to said inner sleeve end;

a braid positioned over said hose and inner sleeve and having a braid end; and

an outer sleeve positioned over said braid and having an outer sleeve end welded to said braid end and to said fitting at said welding section.

5,069,254

CONDUIT ASSEMBLY FOR CABLING

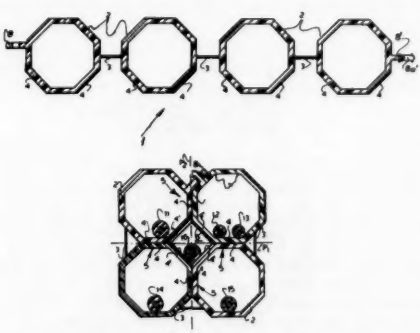
Horst Vogelsang, Herten, Fed. Rep. of Germany, assignor to Dipl. -Ing. Dr. Ernst Vogelsang GmbH & Co. KG, Herten, Fed. Rep. of Germany

Filed Dec. 14, 1989, Ser. No. 450,866

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1988, 3843118; Feb. 13, 1989, 3904199; Feb. 17, 1989, 3904828

Int. Cl.[5] H02G *3/04, 9/06*

U.S. Cl. 138—111 **8 Claims**



1. A conduit assembly for cabling, comprising:

four mutually parallel extruded plastic tubes having generally the same geometrical shapes and adapted to be traversed by respective cables, each of said tubes having a closed inner periphery and an octagonal outer periphery defined by eight angularly adjoining flat surfaces;

respective flexible webs joining said tubes in pairs whereby said tubes can be swung about the respective webs so that two of said flat surfaces of each tube form contact surfaces oriented at a right angle to each other and lying directly against respective flat contact surfaces of two others of said tubes to form a tube bundle therewith having two

mutually perpendicular planes of substantial symmetry and defining a central hollow space between said tubes and within said bundle which is defined by flat surfaces of said outer peripheries between each of said two flat contact surfaces; and

means for retaining said tubes in a configuration of said bundle, each of said inner peripheries being substantially octagonal, each of said webs being connected to the tubes of a respective pair centrally of a respective one of the flat surfaces thereof.

5,069,255

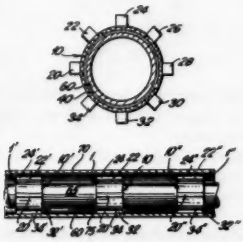
PIPELINE CASING INSULATOR

Larry C. Muszynski, Houston, Tex., assignor to Power Lone Star, Inc., Englewood, Colo.

Continuation of Ser. No. 225,926, Jul. 29, 1988, Pat. No. 4,928,736. This application Mar. 15, 1990, Ser. No. 493,944

Int. Cl.[5] F16L *9/14*

U.S. Cl. 138—149 **10 Claims**



1. A pipeline casing insulation system, comprising in combination:

a coated pipe;

a tubular metallic casing surrounding said coated pipe; and

a pipeline casing insulator positioned between said coated pipe and said tubular metallic casing, said insulator comprising a flexible felt including a pair of opposed spaced, inner and outer facing surfaces separated the thickness of said belt and having a length such that said belt may be mounted on said pipe by circumferentially wrapping said belt around the outer coated surface of said pipe with said inner facing surface abutting the outer coated surface of said pipe;

a plurality of runners mounted on said outer facing surface, each runner comprising a hardened casting formed from an insulative material, said runners substantially spaced in an array to support said pipe within said casing and to prevent the outer coated surface of said pipe from contacting the inner surface of said casing; and

means for connecting said belt to said pipe.

5,069,256

LOOM HARNESS SYSTEM WITH SPACED PARALLEL ROTATING SHAFTS

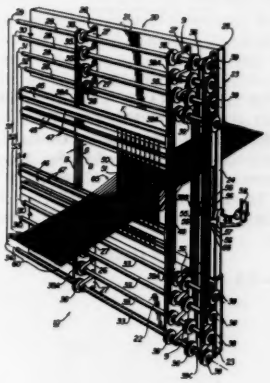
Robert M. Goodman, Jr., 581 Kennesaw Ave., Marietta, Ga. 30060

Filed Dec. 8, 1989, Ser. No. 447,836

Int. Cl.[5] D03C *13/00*

U.S. Cl. 139—83 **42 Claims**

1. A loom harness having a pair rotatable elongated structural elements disposed about parallel axes, said elements having outer surfaces conforming to the shape of a cylinder and associated plane of linear movement tangent to each pair of said surfaces, a straight row of heddle eyes which are also parallel to said pair of parallel axes, independent flexible means for positioning said heddle eyes within the tangent plane, each pair of said elements with their parallel axes and associated tangent plane being arranged to take the form a scroll, and wherein said structural elements are supported along their respective parallel axes at least two locations, said locations being selected to minimize stress and deflection of said structural elements, and multiple scroll forms, each comprising a pair of rotatable structural elements with parallel axes and an associated tangent planes, said scroll forms being spaced sufficiently to permit nesting of the scroll forms in a manner such that the multiple associated tangent planes are parallel to each other and spaced one from the next by uniform spacing or gauge.



5,069,257

METHOD OF REGULATING THE SPEED OF WARP THREADS AS A FUNCTION OF WEAVE PATTERN AND WARP TENSION

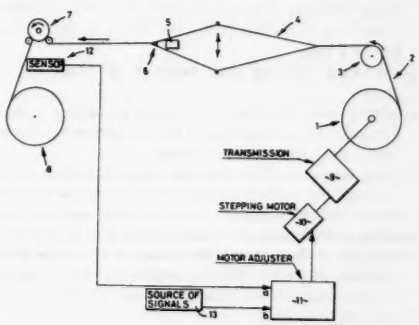
Fred Borisch, Breul 22, D-4400 Münster, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 243,392, filed as PCT/DE88/00005 Jan. 6, 1988, abandoned. This application Apr. 5, 1990, Ser. No. 505,756

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1987, 3700240

Int. Cl.[5] D03D *49/06*

U.S. Cl. 139—99 **4 Claims**



1. A weaving method comprising the steps of advancing a first set of threads at a variable speed along a first path; conveying a second set of threads along a second path transverse to said first path, said first and second paths having an intersection; weaving the threads of said first set with the threads of said second set at said intersection to form a fabric having a predetermined weave in which each thread of said first set advancing between different threads of said second set defines across the fabric a predetermined pattern which is a function of the distance covered by the respective thread of the first set; advancing the fabric along a predetermined path; monitoring the tension of the first set of threads; and regulating the tension

of the fabric and of the threads of the first set, including controlling the speed of the first set of threads in dependency on said predetermined pattern and in dependency on the monitored tension.

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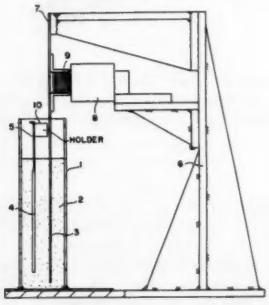
5,069,258

DEVICE FOR THE VIBRATION FILLING OF POROUS PLAQUES FOR VOLTAIC CELLS

Otwin Imhof, Nürtingen, Fed. Rep. of Germany, assignor to Deutsche Automobilgesellschaft mbH, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 373,407, Jun. 30, 1989, abandoned. This application Oct. 26, 1990, Ser. No. 604,337
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1988, 3822209
Int. Cl.[5] H01M *4/72*
U.S. Cl. 141—1.1 **1 Claim**



1. A method for vibration filling a porous fiber structure electrode plaque, having a mean pore diameter of approximately 70 to 90 μm and being available in thick and thin sizes, for voltaic cells, the method comprising the steps of:

immersing the porous fiber structure electrode plaque in a filling chamber means containing an active compound comprising a viscous paste, the filling chamber means having a base;

immersing a vibrating plate means in the filling chamber means;

arranging said vibrating plate means to have a principal vertical surface at an angle of 90° with respect to the base within the filling chamber means;

holding the porous fiber structure electrode plaque substantially parallel to the principal surface of the vibrating plate means and independently from the vibrating plate means;

spacing said vibrating plate means about 2 to 50 mm from a position of the porous fiber structure electrode plaque, wherein a greater spacing applies to thick electrode plaques and a lesser spacing applies to thin electrode plaques,

spacing said vibrating plate means a distance from the base of the filling chamber means of at least 1 mm wherein if large particles are present in the active compound said distance of at least 1 mm is increased,

allowing a maximum 20% deviation of the dimensions of the immersed part of the vibrating plate means from the dimensions of the porous fiber structure electrode plaque immersed in the active compound such that the longitudinal dimension of the electrode plaque corresponds to 80% to 120% of the longitudinal dimension of the immersed part of the vibrating plate; and

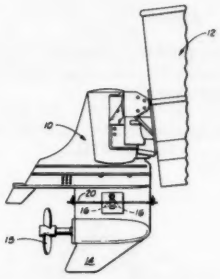
vibrating the active compound with said vibrating plate.

5,069,259

BOAT ENGINE WINTERIZING DEVICE

Marvin A. Ahlefeld, 2005 Rolling Ridge, Bethany, Okla. 73008

Continuation-in-part of Ser. No. 492,846, Mar. 13, 1990, Pat. No. 4,986,319. This application Nov. 5, 1990, Ser. No. 608,835
The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.
Int. Cl.[5] B65B *3/04*; B63B *17/00*
U.S. Cl. 141—98 **2 Claims**



1. A device for winterizing boat engines by replacing at least a portion of the engine coolant with an antifreeze solution, such device comprising:

a pair of spaced, elongated rods having first, opposed end portions, and having second end portions, said rods being spaced from each other over a major portion of their lengths;

an adjustable clamp subassembly interconnecting said first, opposed end portions of the rods and adjustable to move said first, opposed end portions of the rods toward and away from each other;

means interconnecting the second end portions of said rods;

a first sealing head subassembly mounted on one of said rods for axial movement therealong, said first sealing head subassembly including:

a first slide block having an opening therethrough and slidably receiving said one rod;

a first resilient sealing ring carried on said first slide block and sealingly engageable with the boat outdrive at a location surrounding and enclosing the water intake ports thereto at a time when the first slide block is positioned opposite said water intake ports;

a fitting connected to said first sealing ring and having an opening into the interior thereof for connection to a flexible tubular member for introducing a solution containing an antifreeze component to said water intake ports via said first sealing ring; and

a second sealing head subassembly movably mounted on the other of said elongated rods for axial movement therealong, said second sealing head subassembly including:

a second slide block having an opening therethrough and slidably receiving said second rod; and

a second resilient sealing ring carried on said second slide block and engageable with the boat outdrive at a location on the opposite side thereof from said water intake ports.

5,069,260

FUEL DISPENSING NOZZLE WITH VAPOR-PROOF SEAL

Reeford P. Shea, 1021 Goldenrod, Corona del Mar, Calif. 92625

Filed Jan. 28, 1991, Ser. No. 646,429
Int. Cl.[5] B65B *1/04, 3/04*
U.S. Cl. 141—292 **15 Claims**

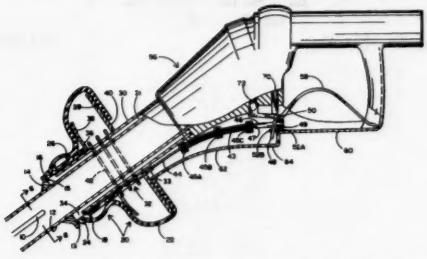
13. A fuel dispensing nozzle to engage the fill pipe of a motor vehicle to supply fuel thereto, said fuel dispensing nozzle comprising a nozzle body, a nozzle spout extending axially outward from said nozzle body and communicating fluidically

with a fuel storage area, and a pump handle to be moved radially relative to said nozzle body to control the flow of fuel from the storage area to the nozzle spout, said fuel dispensing nozzle further comprising,

a vapor vent tube extending axially outward from said nozzle body and arranged in spaced concentric alignment around said nozzle spout so that a vapor recovery path is established therebetween, said vapor recovery path communicating fluidically with the fuel storage area;

sealing means movable axially between distal and proximal positions along said vapor vent tube; and

biasing means interconnected with said sealing means and adapted to move said sealing means to said distal position along said vapor vent tube at which to close the vapor



recovery path and isolate said path from the atmosphere to prevent the escape of hydrocarbon vapors therethrough from the fuel storage area,

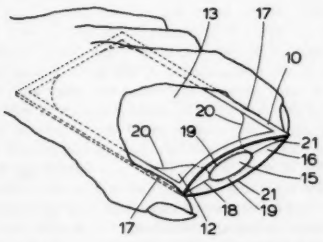
said sealing means being urged by the fill pipe of the motor vehicle against said biasing means and to said proximal position along said vapor vent tube when said dispensing nozzle engages said fill pipe, said sealing means opening said vapor recovery path at said proximal position and forming a seal against said fill pipe to secure said fuel dispensing nozzle to said fill pipe and isolate said fill pipe from the atmosphere, such that said fill pipe and said vapor recovery path are placed in fluid communication with one another to convey hydrocarbon vapors carried by said fill pipe to the fuel storage area by way of said vapor recovery path.

5,069,261

COIN HOLDING DEVICE

Bryan Ji, 265 E. Armitage, Elmhurst, Ill. 60126

Filed Feb. 27, 1991, Ser. No. 661,876
Int. Cl.[5] A45C *1/00*
U.S. Cl. 150—150 **16 Claims**



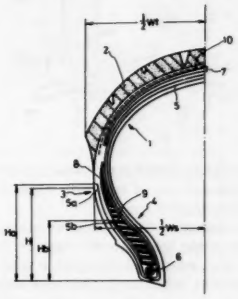
1. A coin holder apparatus comprising two flexible rectangular walls, each wall having two elongated edges and two shorter edges; said walls being secured together along said elongated edges so that said shorter edges will bend to create a chamber between said walls in response to pressure applied along said elongated edges; and a pouch disposed between said walls with an opening to enable access to the interior of the pouch.

5,069,262

MOTORCYCLE TIRE WITH NON-ZERO DEGREE BAND RADIALLY OUTWARD OF THE BREAKER

Eiji Nakasaki, Kakogawa; Hisashi Shirashoji; Katsuyuki Hoshikawa, both of Kobe; Takao Kamijo, Toyonaka; Kazushige Ikeda, Akashi; Yasuhiro Inoue, Himeji, and Takeo Kato, Nishinomiya, all of Japan, assignors to Rubber Industries, Ltd., Kobe, Japan

Continuation of Ser. No. 52,210, May 19, 1987, abandoned, which is a continuation of Ser. No. 720,240, Apr. 5, 1985, abandoned. This application Aug. 7, 1989, Ser. No. 391,702
Claims priority, application Japan, Apr. 6, 1984, 59-69550
Int. Cl.[5] B60C *9/28*
U.S. Cl. 152—536 **10 Claims**



1. A motor cycle tire comprising:

a tread;

sidewalls extending radially inwardly from each tread edge to bead regions;

a bead reinforcement core in each bead region; and

a reinforcement carcass extending through said tread, said sidewalls and wrapped at each of its ends around said bead reinforcement cores,

said carcass comprising parallel reinforcement cords of organic fiber selected from the group consisting of nylon, polyester, rayon and aromatic polyamide fiber laid in a radial direction of the tire,

said tread being reinforced by a breaker disposed radially outward of the carcass and an additional band disposed radially outward of said breaker, said breaker comprising high modulus reinforcement tire cords composed of aromatic polyamide whose tensile strength is not less than 7 grams per denier and whose initial modulus is not less than 200 grams per denier, said cords of said breaker being laid at an angle ranging from 10° to 45° relative to a circumferential direction of said tire, said additional band disposed radially outward of said breaker extending at least beyond both ends of said breaker, said additional band comprising parallel reinforcement cords laid at an angle ranging from 10° to 25° relative to said circumferential direction of said tire and being selected from ply materials from the group consisting of nylon, polyester and rayon,

said tread having a width larger than the maximum width of said carcass measured at a widest point of said sidewalls.

5,069,263

PANEL INTERLOCK SYSTEM

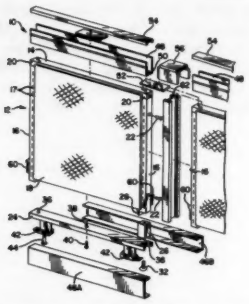
Larry Edwards, Muscatine, Iowa, assignor to Hon Industries, Inc., Muscatine, Iowa

Filed Feb. 8, 1990, Ser. No. 476,797
Int. Cl.[5] A47G *5/00*
U.S. Cl. 160—135 **7 Claims**

1. An arrangement for joining first and second partition

members at adjacent substantially vertical side edges thereof, each such side edge having an upper portion adjacent the top of the partition member and a lower portion adjacent the bottom of the partition member, the arrangement comprising:

an elongated retainer post having a lower portion and a first connecting element affixed within said lower portion, said first connecting element including an aperture defined in the bottom end of said post, said retainer post being disposed between and in contact with the side edges of the first and second partition members,



a second connecting element mounted on said first partition member adjacent one of said side edges and within said lower portion thereof,

said second connecting element defining a cam surface disposed at an angle less than 40° relative to such vertical edges and exposed to and engageable with said first connecting element when said post and respect panel are assembled,

whereby said first connecting element may engage said second connecting element in a cam-action fastening technique thereby drawing said first partition to said retainer post as said engagement occurs.

5,069,264

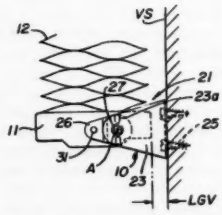
HOLD-DOWN BRACKET FOR BOTTOM RAIL OF A WINDOW COVERING

James A. Klawiter, Madison, Wis., assignor to Graber Industries, Inc., Middleton, Wis.

Filed Feb. 19, 1991, Ser. No. 656,868

Int. Cl.[5] E06B 9/30

U.S. Cl. 160—178.1 **10 Claims**



1. In combination with a door or window covering including an elongated bottom rail, a hold-down bracket for the bottom rail comprising, a bracket member having a mounting flange adapted to be attached to a support surface and leg extending transverse to the mounting flange, a bracket extension, means mounting the bracket extension on the leg for angular adjustment relative thereto about a first axis perpendicular to the leg and spaced a first distance from the mounting flange, bottom rail connector means for connecting an end of the bottom rail to the bracket extension at a location spaced from the first axis a second distance less than said first distance, the bottom rail connector means supporting the bottom rail for pivotal movement about a second axis extending lengthwise of the bottom rail and parallel to the first axis, said means for mounting the bracket extension including means for releasably retaining the bracket extension in at least two different angularly adjusted positions relative to the leg to change the spacing between the bottom rail connector means and the mounting flange.

5,069,265

METHOD OF MAKING A TURBINE ENGINE COMPONENT

William S. Blazek, Valley City, Ohio, assignor to PCC Airfoils, Inc., Cleveland, Ohio

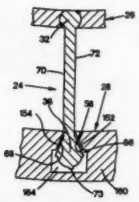
Division of Ser. No. 301,867, Jan. 25, 1989, Pat. No. 4,955,423.

This application Mar. 26, 1990, Ser. No. 499,029

The portion of the term of this patent subsequent to Sep. 11, 2007, has been disclaimed.

Int. Cl.[5] B22C 9/04

U.S. Cl. 164—35 **13 Claims**



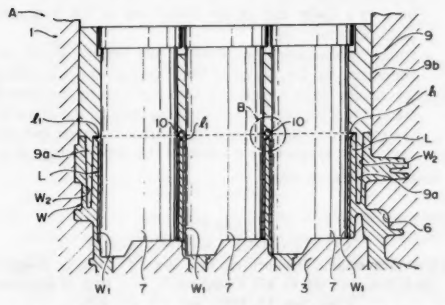
1. A method of making a turbine engine component having a plurality of airfoils disposed in an annular array between an inner shroud ring and an outer shroud ring, said method comprising the steps of positioning a plurality of airfoils having leading and trailing edge portions extending between inner and outer end portions of the airfoils in an annular array with outer end portions of the airfoils at least partially embedded in an annular outer shroud ring pattern which extends across at least a portion of the outer end portion of each of the airfoils and with inner end portions of the airfoils at least partially embedded in an annular inner shroud ring pattern, covering the shroud ring patterns with ceramic mold material to form a mold, removing the material of the shroud ring patterns from the mold to leave coaxial inner and outer shroud ring mold cavities having annular configurations corresponding to the configurations of the shroud ring patterns, the inner and outer end portions of the airfoils being at least partially disposed in the shroud ring mold cavities, filling the inner and outer shroud ring mold cavities with molten metal, said step of filling the inner and outer shroud ring mold cavities with molten metal including the steps of at least partially enclosing the inner end portions of the airfoils with a first annular body of molten metal having a configuration corresponding to the configuration of the inner shroud ring and at least partially enclosing the outer end portions of the airfoils with a second annular body of molten metal having a configuration corresponding to the configuration of the outer shroud ring, said steps of at least partially enclosing the inner and outer end portions of the airfoils with annular bodies of molten metal including conducting molten metal into a portion of at least one of the shroud ring mold cavities which extends across an end portion of each of the airfoils, and solidifying the molten metal in the inner and outer shroud ring mold cavities to form the inner and outer shroud rings, said step of solidifying the molten metal including solidifying the molten metal in the inner shroud ring mold cavity around the inner end portions of the airfoils and solidifying the molten metal in the outer shroud ring mold cavity around the outer end portions of the airfoils, said step of solidifying molten metal in the shroud ring mold cavities including solidifying the molten metal in at least one of the shroud ring mold cavities across an end portion of each of the airfoils.

5,069,266

CYLINDER BLOCK MAKING METHOD AND DEVICE

Shigeki Nakatani, and Takahiro Idemoto, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 467,194, Jan. 18, 1990, abandoned. This application May 14, 1991, Ser. No. 701,578
Claims priority, application Japan, Jan. 19, 1989, 1-10384
Int. Cl.[5] B22D *19/08*
U.S. Cl. 164—112 14 Claims



1. A method for making a cylinder block, comprising the steps of:

providing a plurality of cylinder liners with flange portions,

holding each of the cylinder liners by core means,

arranging said cylinder liners in a side by side relationship relative to one another so as to extend in one direction,

disposing the cylinder liners within a mold cavity in said side by side relationship relative to one another along said one direction,

forming a cylinder bore by said core means and a material holding section above a gap defined by the flange portions of two adjacent cylinder liners, said gap having narrower and wider portions, said material holding section covering at least the narrower portion of the gap and communicating the two adjacent cylinder liners with each other therethrough,

introducing a molten light metal material into the mold cavity for making the cylinder block, and

removing solidified light metal material in the material holding section, together with a surplus portion of said flange portion, from the rest of the cylinder block so as to form, from said flange portion, a top surface of said cylinder block.

5. A device for making a cylinder block including a plurality of cylinder liners with flange portions, arranged side by side, extending in one direction, each of the cylinder liners being casted together with alight metal to form cylinder bores of an engine, comprising:

core means disposed in a mold cavity for engaging each of the cylinder liners, said core means forming cylinder bores corresponding thereto, arranged side by side, with a predetermined distance between adjacent cylinder bores,

material holding means provided above a gap defined by the flange portions of two adjacent cylinder liners, said gap having narrower and wider portions, said material holding means covering at least the narrower portion of said gap and communicating the two adjacent cylinder liners with each other therethrough, above the flange portions of the two adjacent cylinder liners, and

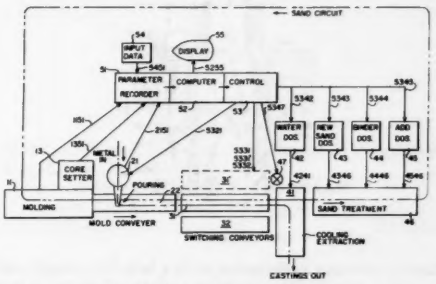
tubular mold means for forming a water jacket, the material holding means including a section formed in the tubular mold means.

5,069,267

AUTOMATIC FOUNDRY PLANT

Kurt H. Larsen, Frederikssund, Denmark, assignor to Dansk Industri Syndikat A/S, Denmark

Filed May 16, 1990, Ser. No. 523,889
Claims priority, application Denmark, May 19, 1989, 2453/89
The portion of the term of this patent subsequent to Oct. 8, 2008, has been disclaimed.
Int. Cl.[5] B22D *2/00, 47/02*
U.S. Cl. 164—155 4 Claims



1. An automatic foundry plant comprising

a) a mold product and preparation station for producing and preparing molds;

b) a mold conveyor for conveying the molds produced and prepared in the mold production and preparation station,

c) a pouring station for receiving molds from the mold conveyor, and for pouring molten metal into the molds conveyed on the mold conveyor,

d) at least two switching conveyors which can be switched into and out of the path of travel of the mold conveyor in such a manner that the switching conveyor switched into said path of travel forms a continuation of the mold conveyor and can receive the molds conveyed on this conveyor,

e) an extracting station for receiving molds conveyed on a switching conveyor, and for separating the molds, castings poured in the molds, and any cores in the molds from each other,

f) parameter recording, computing and control means for receiving information as to the total length of the molds conveyed on the mold conveyor in the conveying direction since the last previous switching of the switching conveyors, and for, in dependence of the information thus received, controlling switching of the switching conveyors in such a manner that when a predetermined length of molds is disposed on a switching conveyor that has previously been switched into said path of travel so as to form a continuation of the mold conveyor, that switching conveyor is switched out of said path of travel and is replaced by another switching conveyor.

5,069,268

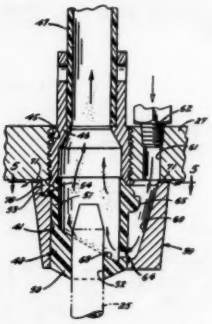
BASIN FORMER FOR A MATCHPLATE MOLDING MACHINE

William A. Hunter, Naples, Fla., assignor to Hunter Automated Machinery Corporation, Schaumburg, Ill.

Filed Mar. 11, 1991, Ser. No. 667,268
Int. Cl.[5] B22C *15/02, 23/00*
U.S. Cl. 164—158 8 Claims

1. In a molding machine, the combination of, a pattern plate having an upwardly extending sprue former, a cope flask located above said pattern plate, a squeeze head located above said cope flask, said pattern plate and said cope flask being adapted to be closed vertically relative to said squeeze head to pack sand in said cope flask against said pattern plate and thereby form a cope mold having a sprue, a basin former extending downwardly from said squeeze head for forming a

pouring basin in the upper side of said mold adjacent the upper end of said sprue, said basin former having a vertically extending passage therethrough, a sand discharge tube communicating with the upper end of said passage, a tubular liner disposed within said passage and communicating with said discharge tube, said liner having a vertically extending side wall and



having a bottom wall formed with a hole for telescopically receiving said sprue former during closing of said cope flask, an opening formed through said side wall and communicating with the interior of said liner above said bottom wall, and means for admitting a flow of pressurized air through said opening and into the interior of said liner thereby to blow loose sand from said liner and into said discharge tube.

5,069,269

LIFTING AND TURNING UNIT FOR A MELTING AND/OR CASTING PLANT

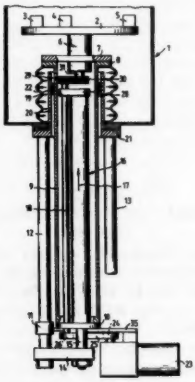
Wolfgang Reuter, Niddatal, and Josef Gediga, Bruchkoebel, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 377,134, Jul. 10, 1989, abandoned. This application Oct. 30, 1990, Ser. No. 609,012

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1989, 3901824

Int. Cl.[5] B22D *5/02, 18/06*

U.S. Cl. 164—325 **23 Claims**



20. A lifting and turning unit for a deposit stand for supporting at least one ingot mold and for use in at least one of a melting system, a casting system or a melting and casting system in a plant, the plant having a predetermined atmosphere in a chamber containing at least the deposit stand, comprising:

a stationary guide mechanism supporting a movable lifter mechanism rotatably connected to the deposit stand;

the movable lifter mechanism having a hydraulic piston-cylinder with a piston rod and having a tubular, vertically oriented lifter column movable in a vertical axial direction by the hydraulic piston-cylinder, the lifter column surrounding the hydraulic piston-cylinder and having an upper end projecting into a region of the chamber;

the guide mechanism having at least one guide column having a first upper end attached to the chamber and a lower region slidable engaging an eye-shaped portion of a component part, the component part being attached to a lower end of the lifter column, the guide mechanism also having a yoke connecting a second lower end of the guide column to a lower end of the piston rod of the hydraulic piston-cylinder; and

a rotary mechanism connected to the deposit stand and supported by the movable lifter mechanism, the rotary mechanism having parts of a drive for rotating the deposit stand, the lifter column carrying the parts of the drive for the rotary mechanism via a foot part at its lower end and carrying a support for rotation of the deposit stand at its upper end.

5,069,270

CONTINUOUS CASTING MOLD

Horst Gravemann, Osnabrueck, Fed. Rep. of Germany, assignor to KM-Kabel Metall AG, Osnabrueck, Fed. Rep. of Germany

Filed Jun. 14, 1989, Ser. No. 365,909

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1988, 3820203

Int. Cl.[5] B22D *11/06*

U.S. Cl. 164—481 **9 Claims**

1. A method of continuous casting comprising, providing side blocks for a continuous casting mold of copper alloy, said copper alloy including from 1.6 to 2.4% nickel, from 0.5 to 0.8% silicon, from 0.2 to 0.4% chromium, from 0.01 to 0.2% zirconium, the remainder copper as well as inevitable manufacturing impurities.

5,069,271

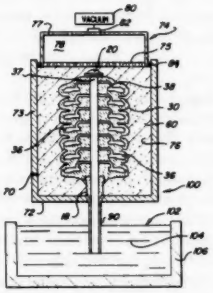
COUNTERGRAVITY CASTING USING PARTICULATE SUPPORTED THIN WALLED INVESTMENT SHELL MOLD

George D. Chandley, Amherst, and Richard T. Carter, Mount Vernon, both of N.H., assignors to Hitchiner Corporation, Milford, N.H.

Continuation-in-part of Ser. No. 579,319, Sep. 6, 1990, abandoned. This application Feb. 25, 1991, Ser. No. 662,338

Int. Cl.[5] B22C *9/04;* **B22D** *18/06*

U.S. Cl. 164—516 **19 Claims**



1. A method of countergravity casting molten metal, comprising the steps of:

(a) forming an expendable pattern of an article to be cast,

said pattern comprising a meltable material that expands upon heating,

(b) investing the pattern with particulate refractory mold material in multiple layers so controlled as to form a thin, refractory shell having a wall thickness not exceeding about 0.12 inch,

(c) heating the invested pattern to remove the pattern from the thin shell to leave a mold cavity therein,

(d) disposing a refractory particulate support media about the thin shell with the mold cavity communicated to a lower molten metal inlet disposed external of the support media,

(e) evacuating the mold cavity,

(f) applying such a pressure to the support media while the mold cavity is evacuated as to compress the support media about the thin shell to support said shell against casting stresses, and

(g) countergravity casting the molten metal upwardly into the evacuated mold cavity while the molten metal inlet is communicated to an underlying source of the molten metal and the shell is supported in the support media.

12. Apparatus for countergravity casting of molten metal, comprising:

(a) refractory particulate support media disposed in a housing,

(b) a refractory investment shell disposed in the support media, said shell having a mold cavity defined by a mold wall thickness not exceeding about 0.12 inch,

(c) a lower molten metal inlet disposed external of the support media for communicating the mold cavity and an underlying source of the molten metal,

(d) means for evacuating the mold cavity,

(e) means for applying such a pressure to the support media while the mold cavity is evacuated as to compress the support media about the shell to support it against casting stresses, and

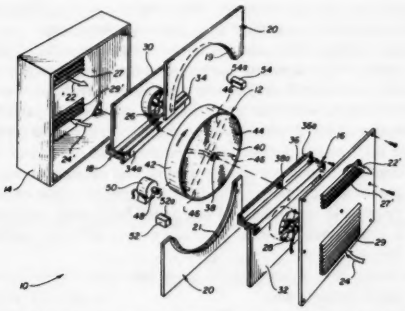
(f) means for communicating the molten metal inlet to said source when the mold cavity is evacuated and the pressure is applied to the support media so as to urge the molten metal upwardly into the evacuated mold cavity.

5,069,272

AIR TO AIR RECOUPERATOR

Bruce J. Chagnot, Athens, Ohio, assignor to Stirling Technology, Inc., Athens, Ohio

Filed Aug. 17, 1989, Ser. No. 395,044
Int. Cl.[5] F28D *19/00*
U.S. Cl. 165—8 **33 Claims**



1. A heat recouperator for ventilating rooms and buildings with minimum loss of heating or cooling, said heat recouperator comprising:

a compact housing adapted to be mounted in a window having first and second sections adapted to convey separate streams of air;

a unitary heat and moisture exchanger, comprising a random matrix media and means to support said random matrix media, said unitary heat and moisture exchanger rotatably mounted in said compact housing and adapted to intersect said first and second sections;

said random matrix media comprising a mat of small diameter heat-retentive fibrous material interrelated by mechanical means to form said mat; and

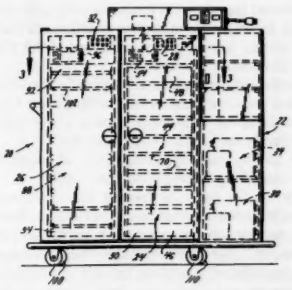
means to rotate said unitary heat and moisture exchanger.

5,069,273

FOOD SERVER

Robert L. O'Hearne, Kirkwood, Mo., assignor to Duke Manufacturing Co., St. Louis, Mo.

Filed Oct. 12, 1990, Ser. No. 596,439
Int. Cl.[5] A47B *31/02*; **F25B** *13/00, 29/00*
U.S. Cl. 165—12 **21 Claims**



1. A food server for simultaneously cold storing foods to be served hot and foods to be served cold, and for heating the foods to be served hot while keeping cold the foods to be served cold, the server comprising:

a cabinet having a first insulated food storage compartment for cold storing foods to be served hot and a second insulated food storage compartment, adjacent the first compartment, for cold storing foods to be served cold, said first compartment including a first region and a second region;

means for circulating air through the first compartment comprising a blower for forcing the circulating air through the first compartment from the first region to the second region;

means for refrigerating the first compartment to a temperature below ambient temperature;

means, independent of the means for refrigerating the first compartment, for refrigerating the second compartment to a temperature below ambient temperatures;

means for heating the first compartment to a temperature above ambient temperature comprising means for heating the circulating air; and

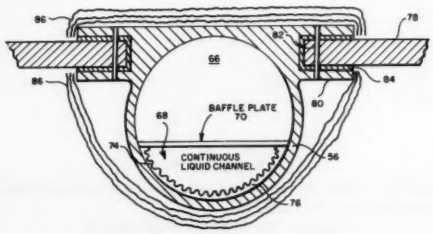
control means for selectively activating and deactivating both the means for refrigerating the first compartment and the means for heating the first compartment for selectively cooling or heating the first compartment depending on whether cold storing or heating of foods stored in the first compartment is desired, so that foods placed in the first compartment are refrigerated for a predetermined duration and then heated without being removed from the first compartment and foods stored in the second compartment are refrigerated while in the second compartment.

5,069,274

SPACECRAFT RADIATOR SYSTEM

Robert A. Haslett, Dix Hills; Robert L. Kosson, Massapequa, and Martin Solon, Plainview, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Dec. 22, 1989, Ser. No. 454,822
Int. Cl.[5] F28F *27/00*; F28D *15/02*
U.S. Cl. 165—32 **7 Claims**



1. A heat pipe radiator comprising:

a plurality of parallel positioned pipes, each having evaporator and condenser sections therealong;

circumferential fine grooves formed along an interior wall of the pipes for creating high film coefficients therebetween for preventing low temperature drops along the evaporator and condenser sections;

a planar baffle located within each pipe for creating separate liquid and vapor channels thus minimizing viscous pressure loss coupled with high capillary rise capability for high hydrodynamic transport capacity;

each pipe having two opposing pairs of elongated spaced flanges extending laterally outward; and

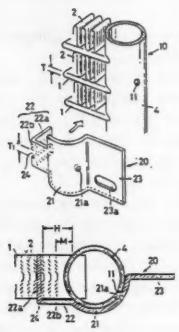
a plurality of fin sections having their respective edges clamped between adjacent pairs of flanges, the material of the fin sections having a lower coefficient of thermal expansion in a direction normal to the fin surface than that of the pipes thereby causing release of clamping pressure therebetween and minimizing heat flow from the fin to the pipe in the event the fin is exposed to a high energy source.

5,069,275

HEAT EXCHANGER

Katsuhisa Suzuki, Utsunomiyashi, and Toshinori Tokutake, Oyamashi, both of Japan, assignors to Showa Aluminum Kabushiki Kaisha, Osaka, Japan

Filed Jan. 28, 1991, Ser. No. 647,289
Claims priority, application Japan, Feb. 1, 1990, 2-23034
Int. Cl.[5] F28F *9/00*
U.S. Cl. 165—67 **7 Claims**



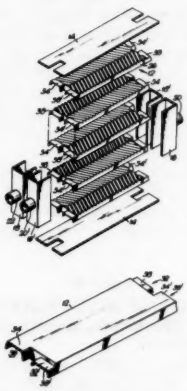
1. A heat exchanger including a heat exchanger body and fasteners attached to the body, the heat exchanger body comprising flat tubes and fin members alternatingly stacked one on another and a pair of hollow headers to which ends of each tube are connected in fluid communication, the fasteners each comprising a contacting concave portion with a shape which fits on the outer peripheral surface of a header of the heat exchanger body, a hooking portion protruding from an end of the concave portion and having a hook end at an extremity of the hooking portion, and a fastening portion extending outwardly from another end of the concave portion, wherein the contacting concave portion is placed in close contact with the peripheral surface of the header, with the hook end inserted in between two adjacent tubes so that the fasteners may be soldered to the heat exchanger body and become integral with it.

5,069,276

HEAT EXCHANGER ASSEMBLY AND PANEL THEREFOR

Pessach Seidel, Jerusalem, Israel, assignor to Oran Heating Equipment Limited, Jerusalem, Israel

Filed Jan. 22, 1991, Ser. No. 644,264
Claims priority, application Italy, Feb. 8, 1990, 93319
Int. Cl.[5] F28F *3/08*
U.S. Cl. 165—166 **18 Claims**



1. A parallel-flow heat exchanger comprised of a plurality of stacked, substantially flat panels defining between them, in the stacked state, spaces through which are adapted to flow the media intended to exchange heat, further comprising:

in said panels, inlet and outlet openings for each of said media, wherein in said stacked state the space between the nth and the (nth +1) of said panels is traversed by one of said media, while the space between said (nth +1) and the (nth +2) panel is traversed by the other one of said media,

said inlet and outlet openings being located outside of the confines of said panels, the axes of said openings lying in planes substantially parallel to the general plane of said panels and the surfaces of said panels being embossed with a corrugated pattern, producing two different surface levels,

an upper level containing the upper side crests of said corrugated pattern, and

a lower level containing the underside crests of said corrugated pattern,

said inlet and outlet openings being surrounded on at least three sides by a portal-like structure, and the upper portion of the portal-like structure of the inlet and outlet openings serving one of said media being substantially co-planar with said upper level, and the upper portion of the portal-like structure of the inlet and outlet openings

serving the other one of said media being substantially co-planar with said lower level.

12. A panel for a multipanel heat exchanger made of a relatively thin, thermally conductive material, comprising:

a major surface provided with an embossed pattern giving a dimension of depth to said relatively thin panel material, and

a peripheral skirt comprising inlet and outlet openings for each of the heat-exchanging media,

said inlet and outlet openings being located outside of the confines of said major surfaces of the panel, the axes of said openings lying in planes substantially parallel to the general plane of said panel,

said embossed pattern producing two different surface levels, an upper level containing the upper side high points of said embossed pattern,

said inlet and outlet openings being surrounded on at least three sides by a portal-like structure, and

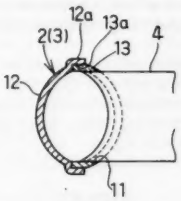
said upper portion of the portal-like structure of the inlet and outlet openings serving one of said media being substantially co-planar with said upper level, and the upper portion of the portal-like structure of the inlet and outlet openings serving the other one of said media being substantially co-planar with said lower level.

5,069,277

VEHICLE-LOADED HEAT EXCHANGER OF PARALLEL FLOW TYPE

Miki Nakamura, and Eiji Ohkura, both of Saitama, Japan, assignors to Diesel KiKi Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1990, Ser. No. 492,456
Int. Cl.[5] F28F *9/04*
U.S. Cl. 165—173 **11 Claims**



1. A heat exchanger of the parallel flow type comprising a plurality of flat tubes and corrugated fins stacked alternatively, a first header tank to which said tubes are connected by inserting one end thereof laterally into said first header tank and a second header tank to which said tubes are connected by inserting the other end thereof laterally into said second header tank, characterized in that said header tanks have a substantially elliptical cross section and that each end of each tube inserted laterally into each header tank is cut off along an inner peripheral surface of the header tank with only a predetermined extension into said header tanks to not only assure a desired brazing margin but also reduce a flow resistance.

5,069,278

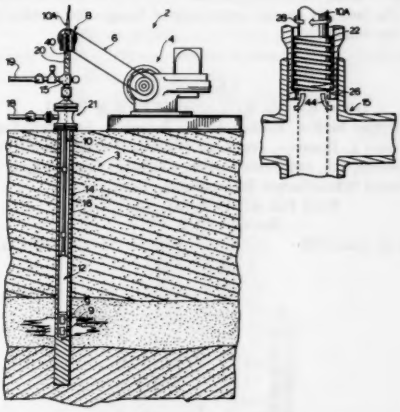
LEAKAGE CONTROL DEVICE

John Blair, Alberta, Canada, assignor to Paul Blair, Edmonton, Canada

Filed Sep. 4, 1990, Ser. No. 577,515
Int. Cl.[5] E21B *43/00*; F04B *35/00*
U.S. Cl. 166—68 **13 Claims**

1. In a wellhead pumping arrangement having a drive shaft, a fitting for directing the flow of a fluid and through which the drive shaft extends, a stuffing box arrangement for limiting the flow of liquid from said fitting along said drive shaft, the improvement comprising a seal enhancement assembly designed to control leakage of fluid between said drive shaft and said stuffing box arrangement, said seal enhancement assembly being disposed intermediate said fitting and said stuffing box arrangement, said seal enhancement assembly having an outer casing through which said drive shaft extends and a rotary member driven by said shaft and cooperating with said casing to urge fluid in contact with said rotary member or said stuffing box arrangement away from said stuffing box arrangement and into said fitting when said drive shaft is driven in its intended operative manner thereby reducing the fluid pressure exerted on said stuffing box to a level substantially below the operating pressure of said wellhead.

8. A seal enhancement assembly for controlling leakage of crude oil at the wellhead for multiple speed rotary helical application comprising a casing with a cylindrical chamber and



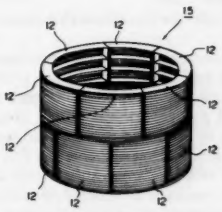
a rotary cylindrical member tightly fitted within said chamber, said rotary cylindrical member having a centrally disposed port for receiving a drive shaft and means for securing said rotary cylindrical member to the drive shaft, said casing being closed by a stuffing box on one side of said rotary cylindrical member and generally open on the other side of said rotary cylindrical member, said rotary cylindrical member including fluid displacement means thereon which cause, in one direction of rotation of said rotary cylindrical member, an action urging any fluid within said casing to move through said open end and thereby reduce the pressure exerted on the stuffing box to a pressure substantially lower than the pressure of the wellhead and reduce leakage through said stuffing box.

5,069,279

WELL STRUCTURE HAVING A SCREEN ELEMENT WITH WIRE SUPPORTING RODS

Tadayoshi Nagaoka, Mihara, Japan, assignor to Nagaoka Kanaami Kabushiki Kaisha, Osaka, Japan

Filed Jul. 5, 1990, Ser. No. 548,103
Int. Cl.[5] E21B *43/08*
U.S. Cl. 166—234 **2 Claims**



1. A well structure comprising:

a) a well curb; and

b) one or more water intake segments mounted in a part of the well curb, each intake segment comprising:

a frame comprising a vertically spaced apart pair of flanges extending in the circumferential direction and a laterally spaced apart pair of flanges extending in the axial direction, said frame having a form which constitutes at least a substantially arcuate segment of a cylinder,

a screen element comprising wire supporting rods extending in the axial direction and secured at the ends thereof to said pair of flanges extending in the circumferential direction, and wires extending in parallel at a predetermined interval therebetween in the circumferential direction and secured at the ends thereof to said pair of flanges extending in the axial direction, and

one or more reinforcing members secured at ends thereof to the laterally spaced apart pair of flanges for reinforcing the frame.

5,069,280

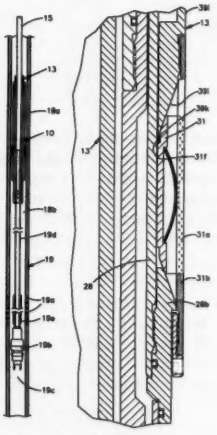
GRAVEL PACKER AND SERVICE TOOL

L. Michael McKee, Broken Arrow; Joseph D. Scranton, Tulsa; Robert L. Brookey, Jenks, all of Okla.; Derrel Gurley, New Orleans, La., and Ernie Sodich, Caldwell, Tex., assignors to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Feb. 12, 1990, Ser. No. 478,377

Int. Cl.[5] E21B *43/04*

U.S. Cl. 166—278 **29 Claims**



1. A packer service tool combination for use in wells having well casings, comprising a tubular gravel packer and service tool combination, said service tool and packer being mechanically connected, said combination being operable sequentially through the operational steps of:

(a) extending slips to lock said packer in said well casing;

(b) extending seals to establish a seal between said packer and said well casing,

(c) releasing a mechanical connection between said service tool and packer, and

(d) opening a passage in said service tool to allow gravel packing;

first fluid pressure-responsive means operating to extend said slips and extend said seals, second fluid pressure-responsive means for releasing said mechanical connection between said service tool and packer, and third fluid pressure-responsive means operating to open said passage, said second fluid pressure-responsive means being operable in a first mode of operation in response to a tubing pressure within said service tool higher than the pressure in an annulus around said service tool, and in a second mode of operation in response to annulus pressure in said annulus exceeding said tubing pressure.

25. A method of gravel packing a well having a well casing, comprising lowering an interconnected packer and service tool combination into a well to a location requiring gravel packing, and operating said combination through a sequence of operational steps including:

(a) locking said packer in said location and establishing a seal between said packer and said well casing;

(b) releasing said interconnection between said packer and said service tool; and

(c) opening a flow path to permit gravel packing; and providing first and second fluid pressure modes of operation for performing each of said operational steps with each said second mode of operation available for performing the related operational step in the event of failure of the related first mode of operation.

5,069,281

PROCESS FOR ENHANCED DELAYED IN SITU GELATION OF CHROMIUM POLYACRYLAMIDE GELS

James E. Tackett, Jr., Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Nov. 5, 1990, Ser. No. 609,490

Int. Cl.[5] E21B *33/138*

U.S. Cl. 166—295 **38 Claims**

1. A process for selectively plugging high permeability regions in a subterranean hydrocarbon-bearing formation penetrated by a well bore in fluid communication with said high permeability regions, the process comprising:

predetermining a gelation delay time required to place an aqueous gelation solution into said high permeability regions;

preparing at the surface said aqueous gelation solution comprised of a polyacrylamide polymer containing less than about 0.1 mole % polymer carboxylate groups, a delaying agent, an aqueous solvent, a buffer, and a polyvalent metal carboxylate crosslinking agent capable of crosslinking polyacrylamide;

injecting said aqueous gelation solution into said high permeability regions via said well bore;

gelling said aqueous gelation solution in said high permeability region after said gelation delay time to reduce the permeability of said region.

5,069,282

MECHANICAL DOWN JAR MECHANISM

William T. Taylor, 1412 Cottage Dr., Houma, La. 70360

Filed Dec. 10, 1990, Ser. No. 625,113

Int. Cl.[5] E21B *31/113*

U.S. Cl. 166—301 **14 Claims**

1. A mechanical down jar mechanism for freeing stuck objects within a well bore and for conducting other down hole activities, comprising:

(a) an elongate tubular housing having anvil means;

(b) mandrel means adapted for connection to an object to be moved downwardly within the well bore and being disposed in telescoping relation with said anvil means and said elongate tubular housing, said mandrel means adapted to be struck by said anvil means to impart a downwardly directed jarring force to said object;

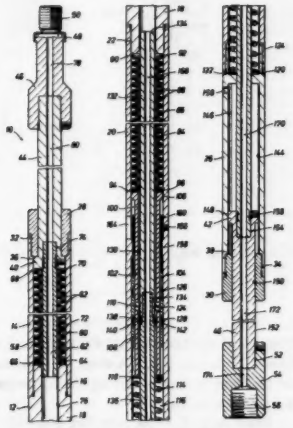
(c) said elongate tubular housing having internal firing and recocking detent groove means located in axially spaced relation and forming a firing lug support land therebetween;

(d) a radially expandable and retractable firing lug assembly being disposed within said elongate tubular housing and in absence of force being applied axially thereto being radially restrained by said firing lug support land;

(e) load spring means being disposed within said elongate tubular housing and being in downward force transmitting relation with said firing lug assembly;

(f) recocking spring means being disposed within said elongate tubular housing and having upward axial force transmitting relation with said firing lug assembly; and

(g) a firing ring being supported in substantially immovable relation with said mandrel means and being positioned for contact by said firing lug assembly, upon predetermined application of downward force to said elongate tubular housing and said load spring means, said firing detent groove being moved downwardly into registry with said firing lug assembly, thus permitting radial expansion of said firing lug assembly into said firing detent groove and permitting rapid downward jarring movement of said anvil means of said elongate tubular housing by said load



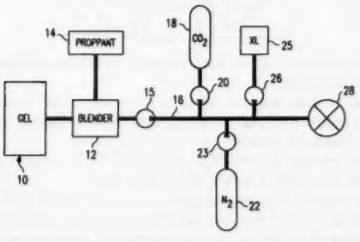
spring means against said mandrel means, upon application of predetermined upward force to said elongate tubular housing and said recocking spring means with said firing lug assembly in its fired condition said recocking detent groove means moving upwardly into registry with said firing lug assembly, thus permitting radial expansion of said firing lug assembly into said recocking detent groove and permitting upward movement of said firing lug assembly past said firing ring to the cocked position thereof.

5,069,283

FRACTURING PROCESS USING CARBON DIOXIDE AND NITROGEN

David J. Mack, Edmond, Okla., assignor to The Western Company of North America, Fort Worth, Tex.

Filed Aug. 2, 1989, Ser. No. 388,672
Int. Cl.[5] E21B *43/26*
U.S. Cl. 166—308 **26 Claims**



1. In a method for the hydraulic fracturing of a subterranean formation penetrated by a well, the steps comprising:

(a) providing an aqueous fracturing fluid for use in hydraulic fracturing of said formation;

(b) incorporating carbon dioxide and nitrogen into said aqueous fracturing fluid, in relative amounts to provide at the wellhead temperature and pressure conditions of said well a composite fracturing fluid having a volume ratio of nitrogen to carbon dioxide within the range of 0.2–1.0 and a volume ratio of carbon dioxide and nitrogen to said aqueous fracturing fluid within the range of 1–4; and

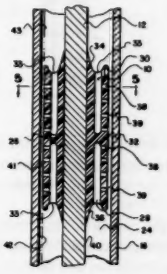
(c) injecting said composite aqueous fracturing fluid into said well under a pressure sufficient to implement said hydraulic fracturing of said formation.

5,069,284

WEAR RESISTANT ROD GUIDE

Kenneth W. Gray, Odessa, Tex., assignor to Joe C. McQueen, Jr., Odessa, Tex., a part interest

Filed Nov. 14, 1990, Ser. No. 613,239
Int. Cl.[5] E21B *17/10, 37/00*
U.S. Cl. 166—311 **15 Claims**



5. A sucker rod guide used in combination with:

a. a series of sucker rods connected end to end forming a sucker rod string,

b. said sucker rod string extending down into a tubing string of a producing oil well from

c. a pump jack located on the surface of the ground above the tubing string to

d. a pump located at a bottom end of the tubing string,

e. said pump forces produced fluid collected at the bottom end of the tubing string up to the ground's surface,

f. said produced fluid occupies a space between the rod string and the tubing string through which the fluid is channeled from the bottom end of the tubing string to the ground's surface,

g. said pump jack raises and lowers the rod string in the fluid being pumped up the tubing string while said fluid bathes the rod string within the tubing string, wherein the improvement comprises the following structure in combination with the above:

h. said guide fitted on said sucker rod string and having passages encased within a body of the guide with the passages having

j. top tunnels and bottom tunnels, each tunnel having a long axis parallel to a long axis of the rod string,

k. said top tunnels open to the fluid in the tubing string at entry ports located at a top surface of the guide,

l. said bottom tunnels open to the fluid in the tubing string at entry ports located at a bottom surface of the guide,

m. the top tunnels and the bottom tunnels separate from one another thereby preventing the fluid from flowing directly through the guide, and

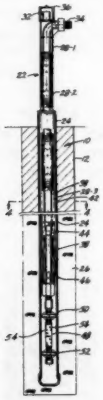
n. at least one nozzle connected to each tunnel and said nozzles are oriented so that an extension of a center axis of each of the nozzles extends away from the guide.

5,069,285

DUAL WALL WELL DEVELOPMENT TOOL

Thomas E. Nuckols, 1531 Ramona Ave., South Pasadena, Calif. 91030

Filed Dec. 14, 1988, Ser. No. 284,087
Int. Cl.[5] E21B *37/08*
U.S. Cl. 166—311 **6 Claims**



3. A method for developing an environmental water well having a perforated casing in a geologic formation from which water can seep into the well, the method comprising the steps of

reciprocating in the casing at the formation a development tool to surge water in the well from the well through the casing into the formation and from the formation into the well, and

pumping water and sediments in the well from the well via the development tool while performing the reciprocating step, the pumping step being performed without exposure of the formation and the well to fluids different from fluids occurring in the formation.

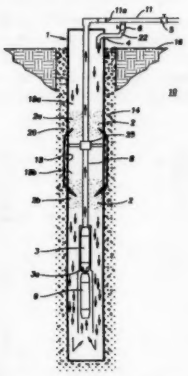
5,069,286

METHOD FOR PREVENTION OF WELL FOULING

L. Frederick Roensch, Chagrin Falls; Kelvin Y. Chang, Solon, both of Ohio, and Clarence T. Tanner, Arlington, Tex., assignors to The Mogul Corporation, Chagrin Falls, Ohio

Filed Apr. 30, 1990, Ser. No. 516,177
Int. Cl.[5] E21B *37/08*
U.S. Cl. 166—312 **22 Claims**

1. A method of cleaning and maintaining a water well penetrating a subterranean formation for the production of water which comprises treating said well by recirculating water through the well, adding an aqueous solution of an anionic polymeric sequesterant into said well in an amount and for a period of time effective to sequester metal cations and subsequently adding to said well an effective amount of at least one biocide.

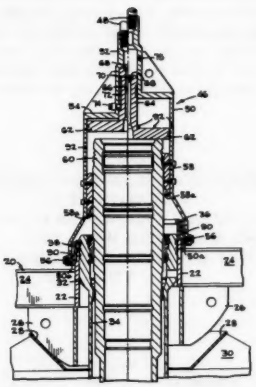


5,069,287

RETRIEVABLE GUIDE BASE FOR SUBSEA WELL

David E. Short, Houston, Tex.; Arthur G. Ahlstone, Ventura, Calif., and William A. Valka, Spring, Tex., assignors to FMC Corporation, Chicago, Ill.

Filed Aug. 1, 1990, Ser. No. 561,542
Int. Cl.[5] E21B *7/128*
U.S. Cl. 166—339 **11 Claims**



1. A retrievable guide base for use on a subsea wellhead, said base comprising:

a) a central annular structural member for positioning around a well pipe housing, said housing having an external annular groove;

b) an annular groove in a surface of the structural member for receiving a split locking ring; and

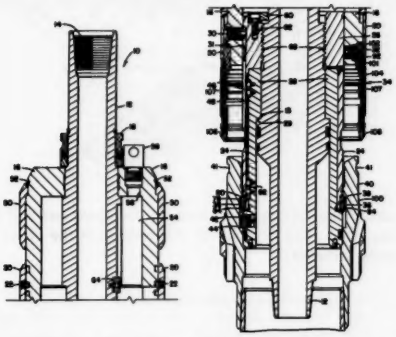
c) an axially, bi-directional locking ring carried in the annular groove of the base structural member, said ring being inherently biased into a contracted position wherein it resides in both the base structural member groove and the housing groove when said structural member and housing are in a predetermined functional relative position, thereby bi-directionally locking said base to said housing and preventing relative axial movement in either direction therebetween.

5,069,288

SINGLE TRIP CASING HANGER/PACKOFF RUNNING TOOL

Shiva P. Singeetham, Houston, Tex., assignor to FMC Corporation, Chicago, Ill.

Filed Jan. 8, 1991, Ser. No. 638,876
Int. Cl.[5] E21B *23/02, 43/10*
U.S. Cl. 166—348 20 Claims



1. A well tool for running a casing hanger and an annulus packoff into a wellhead housing, said tool comprising an assembly of:

a) a tubular inner mandrel with means to connect it to a pipe running string;

b) an annular outer body surrounding the inner mandrel;

c) an outer sleeve surrounding the outer body;

d) a tubular locking mandrel surrounding an upper portion of the inner mandrel;

e) a tubular inner body surrounding a lower portion of the inner mandrel and surrounded by a lower portion of the tubular locking mandrel;

f) means to prevent relative rotation between the outer body and the locking mandrel;

g) means on the outer body to attach an annulus packoff to the tool; and

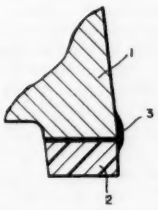
h) means on the inner body to attach a casing hanger to the tool.

5,069,289

PROCESS FOR GLUING TO A HORSE'S HOOF

Allan B. Schaffer, 4751 Del Moreno Dr., Woodland Hills, Calif. 91364

Filed Jun. 18, 1990, Ser. No. 539,425
Int. Cl.[5] A01L *3/00*
U.S. Cl. 168—4 5 Claims



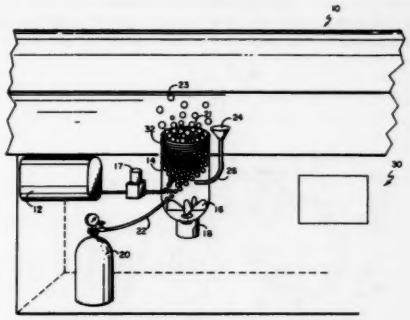
1. A process for bonding to a horse's hoof wherein the hoof is preheated to a temperature of approximately 275 degrees F. prior to the application of a two-component paste-type urethane adhesive having a hardness in excess of about 50 on the Shore D scale so that said adhesive undergoes a phase change at the surface of the heated hoof to produce a highly wetting liquid film.

5,069,290

STRUCTURE AND METHOD OF PRODUCING FOAMS HAVING HYDROGEN-FILLED CELLS FOR USE IN AIRSHIP/BALLOON ENVELOPES

Gregory R. Brotz, P.O. Box 1322, Sheboygan, Wis. 53081

Division of Ser. No. 335,742, Apr. 10, 1989, Pat. No. 4,982,915.
This application Jan. 7, 1991, Ser. No. 638,210
Int. Cl.[5] A62C *2/00, 3/08*
U.S. Cl. 169—45 2 Claims



1. A method of creating a useful foam having mutliple cells, comprising the steps of:

mixing hydrogen gas with a mixture of an organic liquid, a surfactant and a fire retardant;

blending said hydrogen gas at high speed with said mixture to form said foam; and

trapping said hydrogen gas within the cells of said foam.

5,069,291

METHOD AND APPARATUS FOR SUPPRESSING EXPLOSIONS AND FIRES AND PREVENTING REIGNITION THEREOF

Michael O. O'Connell, Knockaneaday, Ballineem, County Cork, Ireland

Continuation of Ser. No. 382,049, Jul. 19, 1989, Pat. No. 4,986,366, which is a continuation of Ser. No. 172,817, Mar. 25, 1988, abandoned. This application Oct. 30, 1990, Ser. No. 605,701
Claims priority, application Ireland, Mar. 25, 1987, 770/87; May 7, 1987, 1129/87; Jun. 24, 1987, 1673/87; Sep. 18, 1987, 2524/87
The portion of the term of this patent subsequent to Jan. 22, 2007, has been disclaimed.
Int. Cl.[5] A62C *35/00*
U.S. Cl. 169—66 5 Claims

1. A fire extinguishing apparatus for extinguishing a fire, the apparatus being responsive to fire conditions within an area, the apparatus comprising:

static reservoir means for containing pressurised water at a pressure substantially above atmospheric pressure;

heating means for heating the water in the static reservoir means without adding any water to the static reservoir means, said heating means heating said water to substantially increase the liquid heat content of the water, the static reservoir means having an outlet means through which hot pressurised water is delivered to the area;

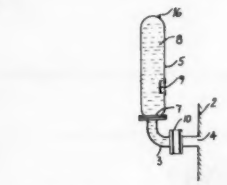
valve means for closing the outlet means, the valve means having an inlet side which is in direct contact with the hot pressurised water in the static reservoir means;

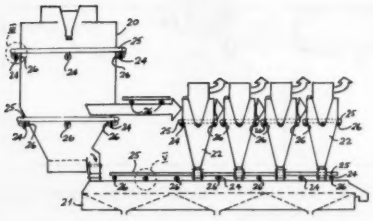
sensing means for detecting the fire conditions in the area; and

actuating means, responsive to the fire conditions, operated

by the sensing means to open the valve means, opening of the valve means introducing pressurised hot water from the static reservoir means into the area at a pressure higher than that in the area, a portion of the water forming a vapour cloud on introduction into the area and a portion of the water flashing off as steam on entry to a low pressure area to extinguish a fire, the vapour cloud remaining in suspension to prevent re-ignition,

a portion of the heat content imparted by heating the pressurized hot water being converted into discharge potential





energy and kinetic energy to discharge the pressurised hot water from the static reservoir means; and

a further portion of the heat content imparted by heating the pressurised hot water being converted into additional potential and kinetic energy on introduction into the low pressure area causing a secondary increase in velocity and fragmentation into fine particles which by virtue of their elevated temperature substantially instantaneously absorb heat in an enclosure forming a vapour cloud and flash steam to reduce the oxygen concentration in the enclosure to prevent re-ignition.

5,069,292

METHOD FOR SOIL CLOD/ROOT CROP SEPARATION

Henry A. Baker, and Nathan L. Baker, both of Rte. 2, Burley, Id. 83318

Filed Sep. 21, 1990, Ser. No. 585,977
Int. Cl.[5] A01D *17/10;* **B65G** *15/14*
U.S. Cl. 171—1 **10 Claims**

1. A method of reducing soil clods to soil mixed with a root crop after digging during harvesting, comprising the steps of:

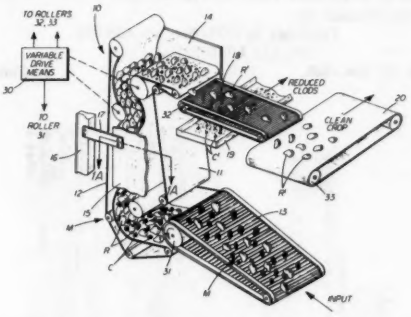
feeding said mixture along an elongated operative path;

manipulating the mixture in a controlled fashion along an upward path to shift and break up the soil clods sufficiently to reduce the size thereof and form soil;

maintaining substantially smooth boundaries along all sides of the path during the manipulating step;

shifting of the crop within the mixture and without substantial separation during the manipulating step;

cushioning the crop with the soil clods and soil mixture during the manipulating step;



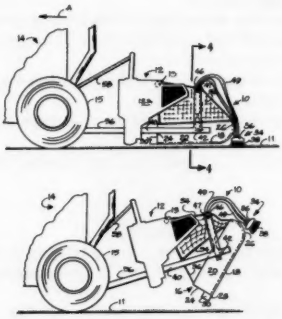
whereby the crop is cushioned by the clods and soil and protected from bruising at the same time the clods are being reduced.

5,069,293

TURF PLUG CATCHER

Thomas E. St. Romain, 1622 Enterprise Blvd., Lake Charles, La. 70601

Filed Aug. 3, 1990, Ser. No. 562,247
Int. Cl.[5] A01B *45/02;* **A01D** *34/12, 34/48*
U.S. Cl. 172—22 **16 Claims**



1. An apparatus for catching and collecting plugs of turf as they are extracted from the ground by an aerating machine having turf plug extractors which extract and discharge said plugs of turf, said apparatus comprising:

a. pan means for receiving and containing said plugs of turf discharged from said aerating machine, a front wall having blade means connected thereto for pushing grass, turf plugs, or other debris in front of said pan means,

b. pan support means rotatably connected to said pan means and rigidly connected to said aerating machine,

c. lifting means for selectively lifting said aerating machine above the ground, and

d. actuator support means connected to said pan support means for supporting actuators which selectively rotate said pan means to dump said turf plugs contained in said pan means, said pan means being adapted to selectively rotate downward about a transverse axis to dump turf plugs on the ground beneath said pan support means when said aerating machine is lifted above the ground.

5,069,294

STUB-SHAFT POWERED SPINNING TILLER

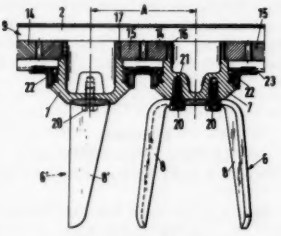
Bruno Barlage; Franz-Josef Robert, both of Hörstel, and Bernd Gattermann, Hude, all of Fed. Rep. of Germany, assignors to H. Niemeyer Söhne GmbH & Co. KG, Hörstel-Riesenback, Fed. Rep. of Germany

Filed May 17, 1990, Ser. No. 525,279

Claims priority, application Fed. Rep. of Germany, May 19, 1989, 3916267

Int. Cl.[5] A01B *33/06, 33/08*

U.S. Cl. 172—49.5 **31 Claims**



1. A soil tiller machine comprising an elongated box beam means extending transversely to the direction of travel of the tiller machine, a plurality of rotatable tiller means having tiller prongs for tilling soil, each of said rotatable tiller means comprising a cup-shaped member having an outer cylindrical surface and a bottom, fastening means fastening said tiller prongs to said bottom of said cup-shaped member, said outer cylindrical surface having an upper portion and an intermediate portion which is disposed between said upper portion and said bottom of said cup-shaped member, gear means mounted on said cup-shaped member at said upper portion of said outer cylindrical surface, a single bearing means for rotatably supporting said rotatable tiller means on said box beam means, said single bearing means being mounted on said outer cylindrical surface of said cup-shaped member at said intermediate portion thereof, said cup-shaped member comprising a one-piece integral rotatable member which mounts said prongs, said bearing means and said gear means, said bearing means mounted on said outer cylindrical surface of said cup-shaped member providing for a large sized bearing means having a diameter of at least one-third the diameter of the working circle of said rotating prongs, said plurality of rotatable tiller means being disposed in linear array along the longitudinal extent of said box beam means, said gear means on one rotatable tiller means meshing with the gear means located on opposite sides of said one rotatable tiller means such that all of said rotatable tiller means are rotated together by said gear means with alternate rotatable tiller means rotating in opposite directions, said gear means of each rotatable tiller means being disposed in a first common plane, said bearing means of each rotatable tiller means being disposed in a second common plane spaced from said first common plane.

5,069,295

SOIL CULTIVATING MACHINE

Bruno Barlage, and Franz-Josef Robert, both of Hörstel, Fed. Rep. of Germany, assignors to H. Niemeyer Söhne GmbH & Co. KG, Hörstel, Fed. Rep. of Germany

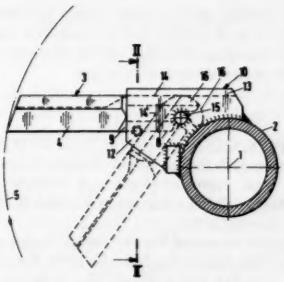
Filed Apr. 9, 1990, Ser. No. 506,980

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1989, 8905025[U]

Int. Cl.[5] A01B *33/14*

U.S. Cl. 172—123 **20 Claims**

1. A cultivating tool for a soil cultivating machine comprising a holding means adapted to be mounted on a rotatable shaft, an implement having a mounting portion, said holding means having a generally U-shaped channel receiving said mounting portion of said implement, a pin in said channel, said mounting portion of said implement having a hook which receives said pin, cooperable retaining means in said channel and on said mounting portion of said implement which are cooperable for retaining said implement in said channel, said implement having a mounted position on said holding means in which said implement is operable to cultivate soil when said shaft is rotated in one direction, said hook engaging said pin and said retaining means being engaged when said implement is in said mounted position, said implement having a demounting position pivotably spaced from said mounted position, said hook being unhookable from said pin and being removeable from said holding means when said implement is in said demounting position, said implement being mountable on said holding means by hooking said hook on said pin and pivoting said implement to effect engagement of said retaining means in said channel and on said mounting portion of said implement, said implement being demountable from said holding means by pivoting said implement and disengaging said retaining means



and subsequently unhooking said hook from said pin, said retaining means comprising two spaced side walls which form a part of said U-shaped channel, said U-shaped channel having a base wall from which said two spaced side walls extend, said mounting portion of said implement having spaced side walls extending from a transverse wall, said transverse wall engaging said base wall when said implement is in said mounted position, said spaced side walls of said U-shaped channel having spring properties which enable the spaced side walls to be temporarily sprung apart from one another to receive said mounting portion of said implement when said implement is being mounted and demounted on and from said holding means and which further biasingly clamps and retains said mounting portion in said channel when said implement is in said mounted position, said implement side walls having bevel portions which provide run-up ramps to facilitate movement of said implement as said implement is being mounted on said holding means.

5,069,296

PITCH/TILT DOZER

Rudolf Horsch, Wausau, Wis., assignor to Case Corporation, Racine, Wis.

Filed Jun. 5, 1990, Ser. No. 533,326

Int. Cl.[5] E02F *3/76*

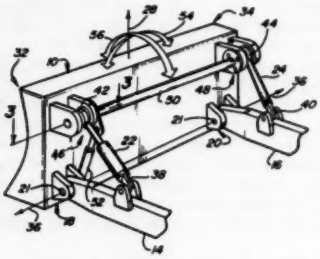
U.S. Cl. 172—825 **11 Claims**

1. An apparatus for setting the pitch of a bulldozer blade, said bulldozer of the type having two spaced forwardly extending push beams, each said beam respectively associated with and pivotally attached to a respective side of said blade, thereby permitting said blade to pivot about a first axis, comprising:

a first support strut having a first and second end, said first end pivotally attached to said bulldozer, and

a first cam having a rotational axis and a first and second surface concentric to said rotational axis and a surface eccentric to said rotational axis and lying between said first and second concentric surfaces, said eccentric surface of said first cam rotatably fastened to said second end of

said first strut and said first and second concentric surfaces of said first cam rotatably fastened to said blade spaced from said first axis of said blade,



whereby rotating said first cam causes said blade to move relative to said second end of said first support strut, thereby changing the pitch of said blade by causing said blade to rotate about said first axis.

5,069,297

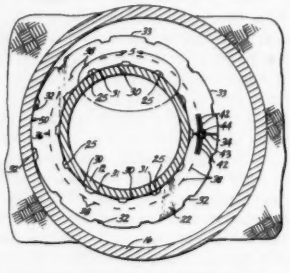
DRILL PIPE/CASING PROTECTOR AND METHOD

R. Ernst Krueger, deceased, late of Newport Beach by Vera B. Krueger, legal representative , and William E. Krueger, Orange, both of Calif., assignors to Rudolph E. Krueger, Inc., Newport Beach, Calif.

Continuation-in-part of Ser. No. 469,632, Jan. 24, 1990, abandoned. This application May 15, 1990, Ser. No. 523,763

Int. Cl.[5] E21B *12/00, 17/10*

U.S. Cl. 175—65 **46 Claims**



19. An underground drilling system comprising:

a well bore in an underground formation;

a fixed tubular casing installed in the well bore;

a rotary drill pipe extending through the casing and having an O.D. spaced from an I.D. of the casing or well bore during normal drilling operations;

a protective sleeve mounted around the drill pipe and spaced from the I.D. of the casing or bore for preferentially contacting the I.D. of the casing or bore when the drill pipe deflects off-center in the casing or bore to protect the casing or bore from contact with the drill pipe or its tool joints during rotation of the drill pipe, the protective sleeve being mounted to the drill pipe to substantially reduce the rotational rate of the sleeve upon frictional contact of the sleeve with the I.D. of the casing or bore while allowing the rotary drill pipe to continue rotating within the sleeve at a rotation rate sufficient to conduct drilling operations in the formation; and

mounting means between the sleeve and drill pipe comprising a double-wedge arrangement including means for producing a film of lubricating and supporting fluid between the O.D. of the drill pipe and the I.D. of the sleeve during drilling operations in the formation which tends to reduce the effects of torque or drag acting on the rotating drill pipe when the sleeve contacts the casing or bore.

26. A method for drilling a bore in an underground formation, the method comprising mounting a protective sleeve at one or more spaced apart locations along a drill pipe that rotates within the bore during drilling operations, including mounting the protective sleeve around the drill pipe for rotation with the drill pipe during normal drilling operations so as to preferentially contact the wall surface of the bore or a casing installed in the bore to protect the wall surface of the bore or casing or the rotating drill pipe from damage, the sleeve being mounted to the drill pipe so that upon frictional contact between said wall surface and the outer surface of the sleeve, the sleeve is caused to greatly reduce its rotational rate upon said contact while allowing the drill pipe to continue rotating within the sleeve sufficiently to conduct drilling operations in the formation.

5,069,298

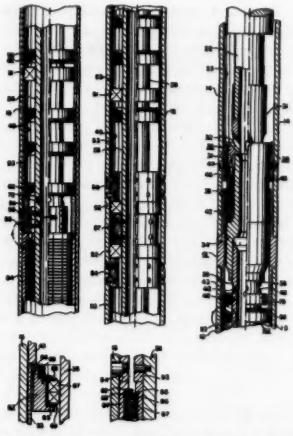
WELL DRILLING ASSEMBLY

Charles H. Titus, 323 Echo Valley La., Newtown Square, Pa. 19073

Filed Apr. 30, 1990, Ser. No. 516,151

Int. Cl.[5] E21B *4/02*

U.S. Cl. 175—107 **2 Claims**



1. In a drilling assembly comprising a drill bit operable to be rotated to produce a well hole of a given diameter, a hollow casing having an interior cylindrical surface at its lower end at a level spaced above the drill bit at the bottom of the hole, an upright rotary shaft mounted concentrically within the cylindrical surface in the lower end of said casing and projecting downwardly therefrom at its lower end to rotate the drill bit, rotary drive means mounted adjacent the upper end of said casing above said drill bit and drivingly connected to the upper end of said rotary shaft, said shaft providing flow passages for directing drilling mud to said drill bit, and supply means to supply drilling mud to said drive means to rotate the rotary shaft, said drive means operating to discharge drilling mud into said flow passages, said discharged mud being ejected through said drill bit to entrain drilling debris and being carried out of the hole by upward flow outside of said casing; the improvement wherein

the lower end of the rotary shaft is hollow to define said flow passage centrally therein, and has an outer cylindrical surface parallel to the interior surface of said casing and an outer diameter less than the inner diameter of said casing to provide an outer pressure passage along the outer cylindrical surface thereof, said flow and pressure passages having upper and lower interconnections at

spaced upper and lower locations along the shaft respectively, the lower end of the flow passage being in fluid communication with the interior of said drill bit, and the lower end of the pressure passage being in fluid communication with the exterior of said drill bit and with the outside of said casing,

upper and lower radial and thrust bearings in said pressure passage between said upper and lower interconnections and above the lower end, said bearings supporting said rotary shaft in said casing against radial and axial displacement relative to said casing, said upper radial bearing being above said upper thrust bearing and said lower radial bearing being below said lower thrust bearing,

a selected volume of lubricant in said pressure passage between said shaft and said casing forming a body of lubricant engulfing said bearing,

upper and lower seals between said body and said interconnections to limit flow of drilling mud into said body of lubricant, and flow of lubricant from said body toward said interconnections, each said seal comprising a plurality of axially-elongated rings mounted between said interior circumferential surface and said outer cylindrical surface and slidable longitudinally therealong, each said ring having an outer sealing element about its outer periphery adjacent one transverse end surface of the ring in sealing engagement with said interior surface of the casing, and having packing elements spaced axially from said outer sealing element around the inner periphery of said ring in sealing engagement with said outer surface of the shaft, whereby said rings may float longitudinally of said rotary shaft relative to each other and relative to said interconnections and said bearing while maintaining a sealed transverse barrier across the pressure passage between said outer surface of said shaft and the interior surface of said casing, each ring having said one transverse end surface directed toward one of said interconnections and the other transverse end surface directed toward one of said bearings, one plurality of said rings being spaced apart from one another in the space between said upper connection and said upper radial bearing means, and a second plurality of said rings being spaced apart from one another in the space between said lower interconnection and said lower radial thrust bearings, and

a labyrinth providing a rotating orifice in said pressure passage between the lower interconnection and the lower end of the casing to maintain a pressure differential between the exterior of said drill bit and said lower seal.

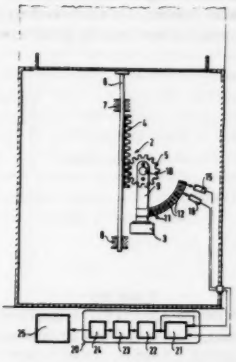
5,069,299

LETTER SCALE AND FRANKING MACHINE INCORPORATING SAME

Jean-claude Haroutel, Orsay, France, assignor to Alcatel Satmam, Bagneux, France

Filed Jun. 29, 1990, Ser. No. 545,733
Claims priority, application France, Jun. 30, 1989, 89 08828
Int. Cl.[5] G01G *19/40*
U.S. Cl. 177—25.15 **4 Claims**

1. Letter scale adapted to be connected to a postal charge calculator unit and a printhead of a franking machine, comprising a horizontal plate adapted to receive a letter to be weighed and to move vertically due to the weight of said letter, a coding arm mechanically coupled to said plate so as to move with it, coding elements on said arm, fixed sensing means facing towards said arm to sense said coding elements as they move relative to said sensing means due to movement of said arm, a processor unit connected to said sensing means and adapted to produce a measurement signal indicating one of a series of predetermined weight ranges within which the weight of the letter lies, a partly closed, flat, vertical casing housing at least said coding arm and said sensing means, and a vertical slot in an upper surface of said casing into which a letter is inserted to weigh it, said horizontal plate forming the bottom of said vertical slot, wherein said processor unit is outside said casing which has on a vertical surface parallel to said slot a connector for connecting said sensing means to said processor unit, and wherein said sensing elements comprise a series of regularly



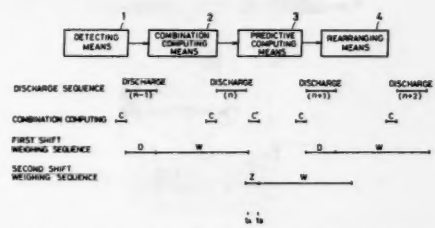
spaced apertures defining a bar code and said sensing means comprises two photo-electric sensors in quadrature facing said apertures and connected to said connector.

5,069,300

CALIBRATION SYSTEM FOR A COMBINATION WEIGHING APPARATUS

Yoshiharu Toyoda, Akashi, Japan, assignor to Yamato Scale Company, Limited, Akashi, Japan

Filed Apr. 19, 1990, Ser. No. 511,244
Claims priority, application Japan, Apr. 19, 1989, 1-99800
Int. Cl.[5] G01G *13/16, 23/14*
U.S. Cl. 177—25.18 **5 Claims**



1. A zero-point calibration system in a combination weighing apparatus having buckets storing processing, the system comprising:

(a) detecting means (1) for detecting when a number of buckets available in the next cycle becomes definite;

(b) combination computing means, responsive to the detecting means (2) for calculating the number of the buckets from which the masses are discharged in the next cycle of combination processing, by computing possible combinations of the buckets to be selected in the selection;

(c) predictive computing means (3) for effecting a predictive calculation of a further number of the buckets which would be available in the selection in the cycle after the next cycle of combination processing, based on the number of buckets calculated by the combination computing means (2); and

(d) zero-point calibrating means for blank weighing a selected one or more of the buckets;

(e) rearranging means (4) for changing states of one or more of the selected buckets from their inactive states for blank weighing in zero-point calibration into their operative states for the actual weighing of the masses which are subject to the selection in the cycle after the next cycle of

combination processing, when the further number is less than a predetermined number whereby the number of the buckets available to said cycle after the next cycle of combination processing is increased in a case wherein the further number predictively calculated by the predictive computing means is less than the predetermined number.

5,069,301

VEHICLE POWER ASSISTED STEERING SYSTEM

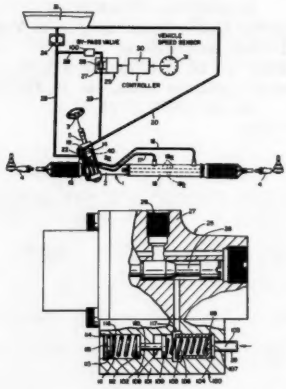
Frederick J. Adams, Clevedon, Great Britain, assignor to TRW Cam Gears Limited, Clevedon, Great Britain

Filed May 14, 1990, Ser. No. 524,128

Claims priority, application United Kingdom, Jun. 23, 1989, 8914514

Int. Cl.[5] B62D *5/08*

U.S. Cl. 180—143 10 Claims



1. A vehicle power assisted steering system comprising a hydraulic pump having an outlet providing a constant volume output; an open center power assistance valve communicating with said outlet and which is adjustable from a neutral condition in response to a steering input torque during a steering maneuver to control fluid flow from said pump to assist said maneuver; a bypass valve in a fluid line communicating between said outlet and a fluid reservoir and responsive to vehicle speed to increasingly open communication between said outlet and the reservoir as vehicle speed increases and to decrease said communication between said outlet and the reservoir as vehicle speed decreases; said power assistance valve comprising valve members which are relatively displaceable from a neutral condition in response to a steering input torque to direct hydraulic fluid, said valve members in the neutral condition providing intercommunication between said outlet and the reservoir; said valve members being biased to the neutral condition by biasing means, and

a flow sensitive valve in the fluid line communicating between said outlet and the reservoir which includes said bypass valve, said flow sensitive valve including means for reducing flow of fluid through said bypass valve when the flow of fluid reaches a predetermined maximum flow.

5,069,302

VEHICLE HAVING SLIP SUPPRESSING DEVICE AND SUSPENSION CONTROL DEVICE

Fumio Kageyama, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

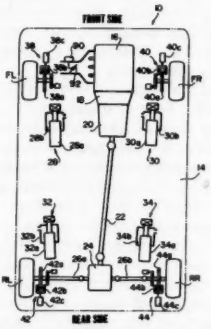
Continuation of Ser. No. 357,420, May 25, 1989, abandoned.

This application Feb. 28, 1991, Ser. No. 663,189

Claims priority, application Japan, May 26, 1988, 63-128741

Int. Cl.[5] B60K *28/16*

U.S. Cl. 180—197 17 Claims



1. A vehicle which comprises:

a power unit;

at least a pair of driving wheels rotated by an output from said power unit;

fluid pressure cylinders, inserted between a vehicle body and said driving wheels, for adjusting a vehicle height of said vehicle body at one end where said driving wheels are placed;

a fluid pressure source for supplying a high-pressure working fluid to said fluid pressure cylinders;

flow control means for controlling supply and discharge of the high-pressure working fluid to and from said fluid pressure source;

slip detection means for detecting a driving force slip of said driving wheels;

brake means for decreasing a rotating force of said driving wheels;

slip suppressing mean for, when said slip detection means detects a slip of said driving wheels, operating said brake means to suppress the slip; and

suspension control means for controlling said flow control means, said suspension control means starting to control said flow control means to supply the high-pressure working fluid to said fluid pressure cylinders in order to increase the height of the vehicle body at said one end where said driving wheels are placed, when said slip suppressing means starts to perform the braking operation as the slip suppressing operation.

5,069,303

HIGH PERFORMANCE MOTORCYCLE STEERING MECHANISM

Robert B. Fuller, Box 8, Wilson, Wyo. 83014

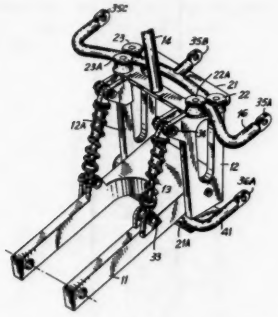
Filed Jun. 29, 1989, Ser. No. 373,892

Int. Cl.[5] B62K *21/00*

U.S. Cl. 180—219 2 Claims

1. A motorcycle with an improved steering mechanism comprising a frame, an engine, a front wheel, a moveable swing arm attached to the front wheel and supporting it in an upright position, means for rotating the wheel about a steering axis to steer the wheel, arcuate tracking means defining an arc and attached to the frame or engine, wherein the swing arm is movably attached to the tracking means so that when the wheel is steered the swing arm moves along the arc of the

arcuate tracking means, a suspension system attached to said swing arm, said suspension system having a first and second end, a side plate pivotally attached to the swing arm, the suspension system being attached at its first end to the side plate



and at the second end to the swing arm, a first plate attached to the side plate, moving means attached to the first plate so that the moving means of the first plate come into contact with the arcuate tracking means and move along the arc of the arcuate tracking means.

5,069,304

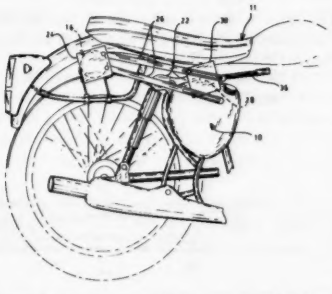
REVERSE DRIVE FOR A MOTORCYCLE

Glenn E. Mann, 122 Sherlake Rd., Knoxville, Tenn. 37922

Filed Mar. 10, 1989, Ser. No. 321,784

Int. Cl.[5] B62D *61/02*

U.S. Cl. 180—221 **5 Claims**



1. A reverse drive apparatus for a motorcycle having at least a front and a rear wheel and a frame, one of said wheels defining a driven wheel which can be rotated by said apparatus in a direction tending to propel said motorcycle backwards, said wheels defining a tire portion having ground engaging tread, said apparatus comprising:

a drive wheel for releasably engaging the tread of said driven wheel;

a DC electric motor;

a drive shaft for connecting said motor to said drive wheel, whereby said drive wheel is selectively rotated when said motor is electrically connected to a DC electrical power source;

a DC electrical power source, said source being electrically connected to said motor such that said drive wheel is rotated in a direction tending to rotate said driven wheel in a direction tending to propel said motorcycle backwards when said driven wheel engages said driven wheel;

support means for securing said motor to said frame and for selectively moving said drive wheel into and out of engagement with said driven wheel, said support means including an actuator shaft having a first end portion rotatably secured to said frame and a second end portion, said actuator shaft carrying an actuating means for selectively rotating said actuator shaft, said support means further including at least one support arm which is adjustable in effective length, said support arm having a first end portion secured to said second end portion of said actuator shaft and a second end portion for engaging and supporting said motor, said first end portion of said support arm defining a longitudinally disposed slot-shaped opening and being provided with a releasable fastener for being received through said slot-shaped opening and securing said support arm to said actuator shaft at selected positions along said slot-shaped opening to adjust the effective length of said support arm, whereby selected rotation of said actuator shaft moves said drive wheel into and out of engagement with said driven wheel.

5,069,305

POWER TRANSMISSION SYSTEM FOR A FOUR-WHEEL DRIVE MOTOR VEHICLE

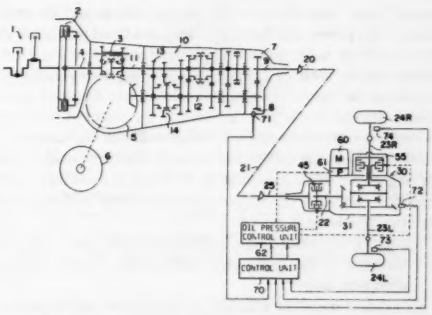
Toshio Kobayashi, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1990, Ser. No. 512,751

Claims priority, application Japan, Apr. 27, 1989, 1-110872; Apr. 28, 1989, 1-111737

Int. Cl.[5] B60K *41/18*

U.S. Cl. 180—249 **7 Claims**



3. In a power transmission system for a four-wheel drive motor vehicle having a transmission operatively connected to an engine through a main clutch for transmitting output torque of the engine through a fluid operated transfer clutch to one of a front differential and a rear differential for transmitting output torque so as to drive front and rear wheels respectively of the vehicle, and each of the differentials having a carrier, the improvement in the system comprising:

a transfer clutch case secured to one of said carrier corresponding to said one differential, said fluid-operated transfer clutch is provided in said transfer clutch case for transmitting the output torque of the transmission to said one differential;

a fluid-operated restricting clutch provided in a restricting clutch case secured to said carrier and disposed between an input element of said one differential provided in said carrier and a corresponding axle, for restricting differentiation of the differential; and

control means for controlling clutch pressure of each of the clutches in accordance with driving conditions of the vehicle, thereby providing a compact and simplified power transmission system.

5,069,306

MOUNTING STRUCTURE FOR THE POWER UNIT OF A MOTOR VEHICLE

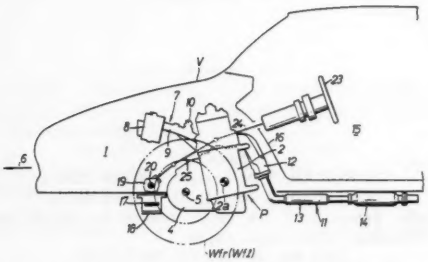
Kazuo Inoue; Shoichi Sano, both of Tokyo; Masami Ogura, Saitama; Kenichi Nagahiro, Saitama; Tsuneo Konno, Saitama; Hajime Kajiwara, Saitama; Yoshinobu Ono, Saitama; Suguru Yoshida, Saitama; Hiroo Shimada, Saitama, and Masahiro Hashiguchi, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1989, Ser. No. 336,656

Claims priority, application Japan, Apr. 11, 1988, 63-88628

Int. Cl.[5] B60K *1/00*

U.S. Cl. 180—291 **3 Claims**



1. A power unit mounting structure in a motor vehicle drivable in a forward running direction including a power unit comprising an engine having a crankshaft, a transmission coupled to the crankshaft of the engine, and a differential interposed between drive axles connected to a pair of laterally spaced front road wheels of the motor vehicle and the transmission, the power unit being mounted in a front portion of the motor vehicle with respect to the running direction of the motor vehicle, with the crankshaft extending transversely with respect to the motor vehicle, characterized in that said power unit is mounted in the front portion of the motor vehicle with its center of gravity positioned rearwardly of the drive axles extending from the differential toward the front road wheels serving as the drive road wheels with respect to said running direction and with the engine generally tilted in the forward running direction;

a steering box extending parallel to the drive axles disposed forward of the drive axles with respect to the running direction; and

an exhaust manifold attached to the engine and disposed at least partially in between the engine and a toeboard separating the engine from a passenger compartment of the motor vehicle.

5,069,307

ACOUSTIC SIGNAL TRANSMITTER FOR LOGGING TOOLS

Keith W. Katahara, Allen, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 6, 1989, Ser. No. 319,607

Int. Cl.[5] G01V *1/40*

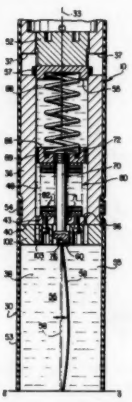
U.S. Cl. 181—105 **15 Claims**

1. An acoustic signal transmitter for a logging tool for imparting a pressure pulse in a fluid filled bore hole, said transmitter comprising:

housing means including a portion defining a fluid filled cavity;

a flexible transmitter member disposed in said cavity and characterized by a relatively thin planar sheet operable to be disposed in a curved position; and

actuator means supported on said housing means and connected to said sheet and responsive to an electrical signal for causing said sheet to change its curvature to displace fluid in said cavity to generate an asymmetric pressure



pulse for transmission through said borehole to a formation into which said borehole penetrates.

5,069,308

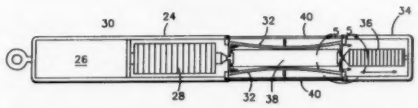
LOW IMPEDANCE DOWN-HOLE ACOUSTIC SOURCE FOR WELL LOGGING

Hezhu Yin; Jerry M. Harris, and Amos M. Nur, all of Stanford, Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Nov. 13, 1990, Ser. No. 611,926

Int. Cl.[5] G01V *1/40;* **H01L** *41/04*

U.S. Cl. 181—106 **17 Claims**



13. A low impedance down-hole source for use in well logging comprising

a first stack of ceramic transducers oriented along the long axis of an ellipse,

a first housing for said first stack of ceramic transducers,

a second stack of ceramic transducers oriented along said long axis of an ellipse,

a second housing for said second stack of ceramic transducers,

a plurality of support members engaging said first and second housings and maintaining said first and second housings in spaced relationship,

a plurality of flexible beams with each beam having a generally elliptical configuration, said flexible beams being positioned in compression around said long axis between said first and second housings, each of said flexible beams including rigid extensions at either end thereof and oriented perpendicular to said long axis,

a support rod positioned along said long axis and engaging points on the inner surfaces of said extensions, and

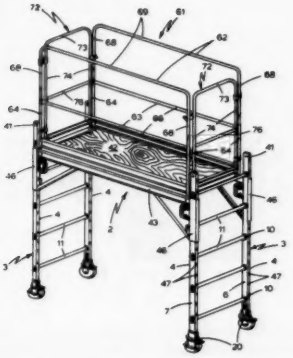
each stack of transducers engaging points on the outer surfaces of said extensions.

5,069,309

ROLLING TOWER SCAFFOLD AND METHOD AND TOOLING APPARATUS FOR MANUFACTURING THE SAME

Paul R. Swiderski, Scott, and Paul J. Seadler, Jefferson, both of Ky., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Sep. 28, 1989, Ser. No. 413,694
Int. Cl.[5] E04G *1/18, 1/30*
U.S. Cl. 182—119 42 Claims



1. A climbing apparatus in the form of a scaffold structure comprising:

a pair of vertically-extending spaced end ladders, each including a pair of spaced opposed vertically-extending rails having sets of spaced horizontally extending step-forming rungs extending therebetween and therethrough with the end portions of said rungs fastened to said opposed vertically extending rails, at least one of said end ladders having hollow tubular rails to provide spaced inner and outer rail walls in each of said opposed rails with the rung end portions of said end ladder rungs each having opposed radially and directly extending spaced detents gripping in face abutting relationship the opposed faces of one of said opposed rail walls in fast position therebetween to firmly secure said rungs in fast position relative to opposed rails; and

a horizontally extending support platform supportively mounted between said spaced, vertically extending end ladders.

5,069,310

INSULATOR CLIMBING SUPPORT

Danny R. Williams, Houston, and Mary A. Barron, Cypress, both of Tex., assignors to Houston Industries Incorporated, Houston, Tex.

Filed Mar. 26, 1991, Ser. No. 675,135
Int. Cl.[5] E06C *7/00*
U.S. Cl. 182—187 14 Claims

1. A climbing support for climbing a stack of insulator disks on electrical power distribution equipment, comprising:

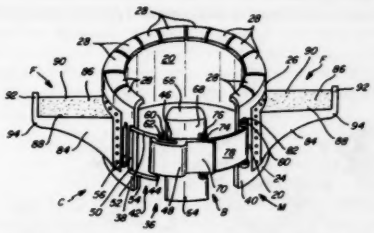
a collar member adapted to fit about an insulator disk in the stack, said collar member comprising:

a cylinder sleeve extending between an upper and lower portion and adapted to enclose side portions the insulator disk;

finger members formed on said upper portion of said cylindrical sleeve extending inwardly and tapering from an outer portion to an inner portion to contact other adjacent finger members to rest on the insulator disk for support;

said collar member having a gap between side portions thereof for movement about the insulator disk;

means for releasably mounting said collar member about the insulator disk; and



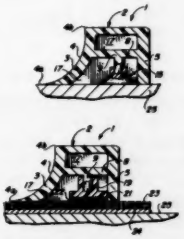
foot support means extending outwardly from said collar member for supporting a climber during climbing of the insulator disk.

5,069,311

INFANT EXERCISER GUARD

Ferris F. Young, CMR-P Box 1032, Apo, N.Y. 09102

Filed Jun. 4, 1990, Ser. No. 534,530
Int. Cl.[5] B60T *3/00*
U.S. Cl. 188—32 7 Claims



1. A guard for mounting on a floor or other supporting surface and arresting the travel of a wheeled infant carrier, said guard comprising stop means adapted for attachment to the floor or other supporting surface and at least one fastener selected from the group consisting of suction cup fasteners and hook and loop fasteners adapted for engaging said stop means and attaching said stop means to the floor or other supporting surface.

5,069,312

HANDBRAKE FOR SINGLE-CYLINDER TRUCK-MOUNTED RAILWAY CAR BRAKE

Wajih Kanjo, Lockport, Ill.; Mark S. Krampitz, Hunker, Pa., and Michael J. Moriarity, Lansing, Ill., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Oct. 15, 1990, Ser. No. 597,121
Int. Cl.[5] B61H *13/02*
U.S. Cl. 188—52 18 Claims

1. A handbrake system for a railway vehicle comprising:

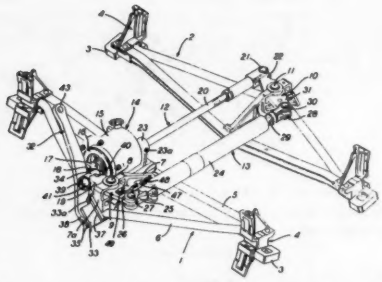
(a) first and second spaced-apart brake beams;

(b) first and second transfer levers pivotally connected at a point intermediate the ends thereof to a respective one of said first and second brake beams;

(c) first and second force-transmitting means interconnected between corresponding arms of said first and second transfer levers;

(d) said first force-transmitting means including brake actuator means operable in response to the supply of fluid pressure thereto for increasing the length of said first force-transmitting means, to accordingly increase the spaced-apart distance between said first and second brake beams;

(e) a transfer link connected to said first transfer lever so as to be arcuately movable therewith in a plane parallel to the plane of rotation of said first transfer lever;
(f) a bearing surface on said first brake beam; and
(g) an actuating lever having a pivotal connection at a location intermediate the ends thereof with said transfer link, one end of said actuating lever being adapted to receive a handbrake force and the other end of said actuating lever being freely engageable with said bearing surface to provide a sliding fulcrum point about which said actuating lever is rotatable.

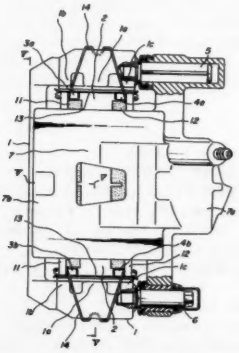


5,069,313

DEVICE FOR PREVENTING DISLODGMENT OF DISC BRAKE PADS

Noboru Kato, and Youichi Fujiwara, both of Nagoya, Japan, assignors to Nisshinbo Industries, Inc., Tokyo, Japan

Filed Jan. 23, 1990, Ser. No. 468,883
Claims priority, application Japan, Jan. 23, 1989, 1-11818
Int. Cl.[5] F16D *55/224*
U.S. Cl. 188—72.3 **2 Claims**



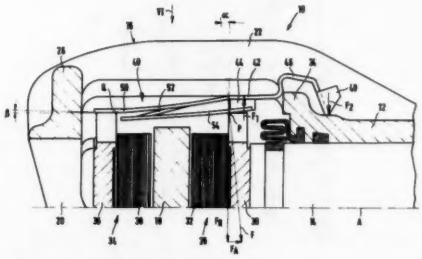
1. In a device for preventing dislodgment of a pair of brake pads of a disc brake including a stationary member provided with rails for movably mounting thereon the brake pads in opposition to each other and retraction springs each having two legs urging the brake pads away from each other; the improvement comprising a central stopper provided on an upper surface of the stationary member between the legs of the retraction springs and end stoppers provided on the upper surfaces of the stationary member on outer sides of the legs of the retraction spring to limit travel of the legs axially of the disc of the disc brake.

5,069,314

SPOT TYPE DISC BRAKE INCLUDING AN IMPROVED HOLD DOWN SPRING

Hans-Georg Madzgalla, and Frank Madzgalla, both of Koblenz, Fed. Rep. of Germany, assignors to Lucas Industries public limited company, Birmingham, England

Filed May 30, 1990, Ser. No. 530,299
Claims priority, application Fed. Rep. of Germany, Jun. 7, 1989, 8906980
Int. Cl.[5] F16D *65/02*
U.S. Cl. 188—73.36 **10 Claims**



1. Spot-type disc brake comprising
first and second brake pads which are adapted to be pressed against respective opposite sides of a brake disc,
a caliper which engages over said pads and said brake discs, and
a hold-down spring of sheet metal supported by a support region formed thereon near said first brake pads on the caliper and extending from said support region in cantilever manner beyond said brake disc, wherein the hold-down spring comprises first, second and third spring legs extending parallel to the axis of said disc, said first and second spring legs being separated from each other by a first axial slot and in the relaxed state lie at least approximately in a common plane and extend beyond said brake disc,
said first spring leg having a portion remote from the support region which portion pressing against said second brake pad,
said second spring leg being separated by a second axial slot from said third spring leg in such a manner that the second and the third spring legs are joined only at their ends remote from said support region without being bent with respect to each other,
said third spring leg pressing with its end near said support region against said first brake pad, said first and second axial slots extending parallel to the axis said disc.

5,069,315

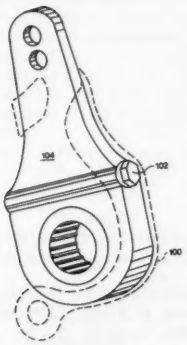
PROTECTION DEVICE FOR A MANUAL SLACK ADJUSTER

Marvin H. VanWeelden, and Susan V. VanWeelden, both of 1153 Florimond Dr., Elgin, Ill. 60123

Filed Jun. 29, 1990, Ser. No. 545,552
Int. Cl.[5] F16D *65/40*
U.S. Cl. 188—79.55 **19 Claims**

1. A protection device for an adjusting means, said adjusting means being used for a brake slack adjuster on an air brake system of a heavy duty truck, wherein:
a. said protection device has a generally elongated, arcuate, central portion;
b. said central portion has a first end and a second end oppositely disposed from said first end to complete said protection device;
c. said protection device has a clipping mechanism at said first end thereof and a gripping member at said second end thereof, with said central portion therebetween;

d. said protection device is sufficiently rigid to protect said adjusting means;
e. said gripping member is adapted to apply or remove said protection device;
f. said clipping mechanism is adapted to grip said brake slack adjuster to thereby hold said protection device over said adjusting means and minimize wear of said adjusting means;



g. said central portion is adapted to be received over a nut of said slack adjuster;
h. said central portion is adapted to cover and protect said adjusting means by receiving said slack adjuster within said central portion; and
i. said protection device is flexible.

5,069,316

BRAKE ACTUATOR WITH ADJUSTER

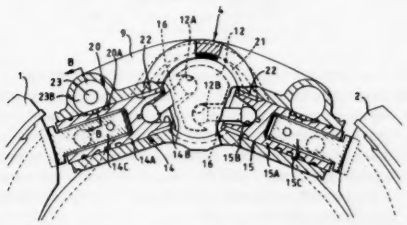
Hugh G. Margetts, Ross on Wye, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Jul. 6, 1990, Ser. No. 549,167

Claims priority, application United Kingdom, Jul. 13, 1989, 8916047

Int. Cl.[5] F16D *51/00*

U.S. Cl. 188—79.62 **15 Claims**



15. A brake actuator comprising an actuator housing, force-applying means received by said housing connected at an axially inner end thereof to a rotary actuator shaft for actuation by the rotary actuated shaft and arranged to separate opposed first and second tappets which transmit thrust from said means to braking elements engaged, in use, by the first and second tappets in order to urge said elements against a rotary braking surface, each first and second tappet including a pair of threadedly interengaged members which are relatively rotatable to enable the length of each first and second tappet to be varied, adjuster means operable in response to excessive outward movement of the braking elements, to vary the length of the first tappets in order to maintain a substantially constant predetermined clearance between the associated braking element and said braking surface, and transmission means interconnecting the first and second tappets to effect a corresponding variation in length of the second tappet, wherein the transmission means lies within the actuator housing at a location adjacent the axially inner end of the in the longitudinal direction of the rotary actuator shaft, the transmission means cooperating with both first and second tappets to transmit adjusting movement of the first tappet to the second, wherein the transmission means is a rotatably mounted ring gear co-axially arranged with the actuator shaft, and wherein the ring gear is rotatably mounted by way of a bearing disposed between the internal periphery of the ring gear and fixed structure extending within the ring gear.

5,069,317

PNEUMATIC SHOCK ABSORBER

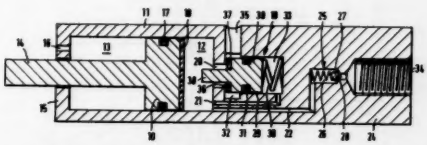
Kurt Stoll, Lenzhalde 72,, 7300 Esslingen, and Herbert Halama, Hildegardstrass 16, 7314 Wernau, both of Fed. Rep. of Germany

Filed Nov. 30, 1988, Ser. No. 277,707

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1987, 3740669

Int. Cl.[5] F16F *9/50*

U.S. Cl. 188—286 **24 Claims**



1. A pneumatic shock absorber comprising a piston, a cylinder in which said piston is able to slide, a piston rod attached to said piston and extending out of said cylinder, a check valve forming an inlet to said cylinder via which a pressure space, delimited by said piston in said cylinder, is connected with an external source of pressure fluid, an outlet valve for the discharge of compressed air during a damping motion of the piston, a valve piston comprised in said outlet valve and arranged to run in a valve chamber of said valve in a sealing manner so as to divide said chamber into first and second chamber parts, said first chamber part connecting a duct, which leads to the pressure space, with an outlet duct, and the connection is able to be interrupted by a valve seat arranged to be shut off at least in part by the end face of the valve piston acted upon by the pressure of the pressure space and the second chamber part is connected with the pressure space or with the pressure source and a spring for urging the valve piston against the valve seat.

5,069,318

SELF-STABILIZED STEPPED CRASHWORTHY STIFFENERS

Richard L. Kulesha; Michael D. Jones, and Thomas E. Schmitt, all of Mesa, Ariz., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Continuation-in-part of Ser. No. 456,464, Dec. 26, 1989, abandoned. This application Jan. 7, 1991, Ser. No. 638,038

Int. Cl.[5] F16F *7/12*; B64C *1/00*

U.S. Cl. 188—377 **5 Claims**

1. In an aircraft, an energy absorbing structure made from an organic polymer reinforced with plies of fibers, comprising:
a columnar stiffener having first and second opposed ends and containing laminations of plies of said fibers having

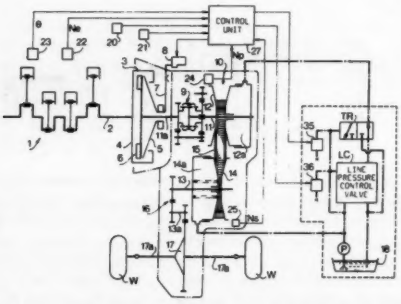
varying lengths so as to produce a stepped arrangement reducing the cross-sectional area in a series of steps from said first end to said second end, so that a self-stabilizing columnar stiffener results such that when said stiffener is subjected to compression loads so as to crush said stiffener, said crushing begins at said first end and progresses in a predictable fashion toward said second end and said stiffener has at any cross section between said first and second ends a local compression strength which is less than the general stability strength of the remaining portion of said stiffener from said cross section to said second end.

5,069,319

CONTROL SYSTEM FOR A CLUTCH OF A MOTOR VEHICLE

Mitsuru Makabe, Mitaka, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1990, Ser. No. 512,750
Claims priority, application Japan, Apr. 28, 1989, 1-111733
Int. Cl.[5] B60K *41/28*
U.S. Cl. 192—0.052 **7 Claims**



1. In a control system of a clutch for transmitting power of an engine to driving wheels of a motor vehicle having a continuously variable transmission interposed between said clutch and said driving wheels, the control system comprising an accelerator pedal switch for detecting a position of an accelerator pedal and for generating an accelerator pedal position signal, a select position sensor provided on said transmission for detecting a selected position of the transmission and for producing a select position signal, an engine speed sensor mounted on said engine for detecting engine speed and for producing an engine speed signal, and vehicle speed calculating means for sensing driven pulley speed of a driven pulley of the continuously variable transmission and for generating a vehicle speed signal, and improvement in the system which comprises:

clutch control mode deciding means responsive to said accelerator pedal position signal, said select position signal and said vehicle speed signal for determining an engaging condition of said clutch in dependency on driving conditions of said vehicle and for generating a mode signal;

clutch engagement mode determining means responsive to said engine speed signal for determining an engine speed changing rate corresponding to said engine speed and for producing an engine speed changing rate signal;

shifting speed setting means responsive to said mode signal, said vehicle speed signal and said engine speed signals for deciding clutch engagement and disengagement patterns in accordance with said driving conditions and for producing a shifting speed pattern signal;

pressure plate position calculating means responsive to said shifting speed pattern signal for calculating a pressure plate position of said clutch by integrating said pattern signal and for producing a position signal applied to said shifting speed setting means; and

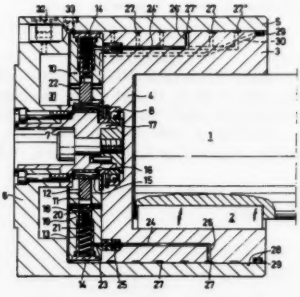
control means responsive to said position and pattern signals for controlling said clutch in a predetermined model pattern corresponding to each driving condition so as to rapidly and smoothly operate said clutch without locking.

5,069,320

TORQUE-LIMITING COUPLING DEVICE

Curt Falk, Hudiksvall, Sweden, assignor to Metalform Safeset AB, Hudiksvall, Sweden

PCT No. PCT/SE89/00371, § 371 Date Dec. 21, 1990, § 102(e) Date Dec. 21, 1990, PCT Pub. No. WO90/00231, PCT Pub. Date Jan. 11, 1990
PCT Filed Jun. 29, 1989, Ser. No. 623,805
Claims priority, application Sweden, Jul. 4, 1988, 8802498
Int. Cl.[5] F16D *7/00*
U.S. Cl. 192—56 R **11 Claims**



1. A torque-limiting clutch arrangement comprising:

two mutually coaxial clutch elements which are non-rotatably connected to a driving shaft and a driven shaft respectively and which engage one another through the intermediary of two mutually opposing friction-surfaces pressed against each other and forming a friction-joint which is dimensioned to slip when a torque on the clutch exceeds a predetermined value; and

a detecting device for detecting slip occurrences in the friction-joint and to disengage the clutch elements when slip occurs;

said friction-joint comprising:

a cylindrical part (3) which is rigidly connected to one of said clutch elements and which has press-fitted thereon a cylindrical sleeve (5) which is connected rigidly to the other of said clutch elements;

a high-pressure pump means (10) which is driven by the detecting device (17) to supply pressure-fluid to an outlet passage (24) when slip occurs in the friction-joint; and

a plurality of openings (27) formed in at least one of the friction-surfaces and communicating with the outlet passage (24) of the pump means, said openings being configured to produce a hydrostatic layer together with the friction-surfaces upon the delivery of pressure fluid.

5,069,321

TORQUE TRANSMITTING AND TORSION DAMPING APPARATUS FOR USE IN MOTOR VEHICLES

Wolfgang Reik, Bühl, and Hans-Dieter Elison, Offenburg, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

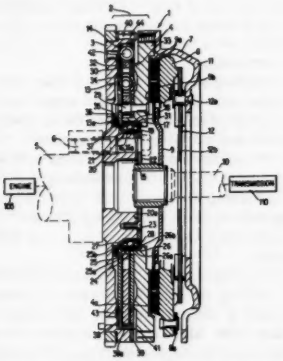
Division of Ser. No. 283,792, Dec. 13, 1988, Pat. No. 4,989,710, which is a division of Ser. No. 132,909, Dec. 14, 1987, abandoned, which is a division of Ser. No. 470, Jan. 5, 1987, Pat. No. 4,727,970, which is a continuation-in-part of Ser. No. 716,838, Mar. 28, 1985, abandoned, and a continuation-in-part of Ser. No. 799,006, Nov. 18, 1985, abandoned, and a continuation-in-part of Ser. No. 848,732, Apr. 4, 1986, abandoned. This application Nov. 21, 1990, Ser. No. 616,640

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1984, 3421709; Nov. 23, 1984, 3442679; Apr. 15, 1985, 3513449; Apr. 16, 1985, 3513479

The portion of the term of this patent subsequent to Mar. 1, 2005, has been disclaimed.

Int. Cl.[5] F16F *15/12*

U.S. Cl. 192—70.17 **8 Claims**



1. Apparatus for compensating for variations of torque, especially for fluctuations of torque which is transmitted between a combustion engine and an input means of a transmission, comprising at least two flywheels which are rotatable relative to each other, one of which is connectable with the engine and the other of which is connectable with the input means of the transmission and carries a disengageable friction clutch; antifriction bearing means interposed between said flywheels; a substantially disc-shaped member non-rotatably connected with said other flywheel; and damper means arranged to oppose rotation of said flywheels relative to each other, said damper means at least comprising energy storing means acting in the circumferential direction of said flywheels, and a friction generating device which is disposed between said flywheels, said friction generating device operating with friction axially between said member and said one flywheel and comprising a friction ring and a stressed energy storing element acting in the axial direction of said flywheels.

5,069,322

SELF ADJUSTING CLUTCH COVER ASSEMBLY

Hiroshi Mizukami, and Heiji Fukutake, both of Neyagawa, Japan, assignors to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Jul. 9, 1990, Ser. No. 550,269

Claims priority, application Japan, Jul. 20, 1989, 1-85131[U]

Int. Cl.[5] F16D *13/75*

U.S. Cl. 192—70.25 **3 Claims**

1. A self-adjusting pull-type clutch, comprising:

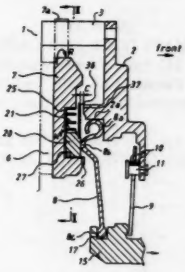
a clutch cover;

a release lever having an outer peripheral fulcrum point supported by said clutch cover, an intermediate pivot point and an inner peripheral fulcrum point;

a pressure plate coupled to said clutch cover and having a lever height adjusting means adjustably coupled to said pressure plate for contact with said intermediate pivot point of said release lever;

spring means coupled to said release lever for pressuring said intermediate fulcrum point into pressing contact with said lever height adjusting means;

clutch release means coupled to said inner peripheral fulcrum point of said release lever for pulling said inner peripheral fulcrum point against the pressing force of said spring means and in a direction away from said pressure plate and toward said clutch cover for moving said pressure plate toward said clutch cover to disengage said clutch;



said pressure plate and said lever height adjusting means having interengaging threaded portions disposed coaxially with respect to the direction of rotation of said pull type clutch for moving said lever height adjusting means outwardly away from said pressure plate to increase the effective height of said intermediate fulcrum point when movement of said pressure plate relative to said clutch cover exceeds a pre-determined distance; and

clearance sensing means mounted on said lever height adjusting means for preventing said moving of said lever height adjusting means outwardly from said pressure plate on said threads until said movement of said pressure plate relative to said clutch cover exceeds said pre-determined distance.

5,069,323

RELEASE BEARING INCLUDING REPLACEABLE BUSH

Hiroshi Takeuchi, and Michitomo Masaki, both of Neyagawa, Japan, assignors to Kabushiki Kaisha Daiken Seisakusho, Osaka, Japan

PCT No. PCT/JP89/01044, § 371 Date May 31, 1990, § 102(e) Date May 31, 1990, PCT Pub. No. WO90/04114, PCT Pub. Date Apr. 19, 1990

PCT Filed Oct. 11, 1989, Ser. No. 536,662

Claims priority, application Japan, Oct. 12, 1988, 63-133594[U]

Int. Cl.[5] F16D *23/00*

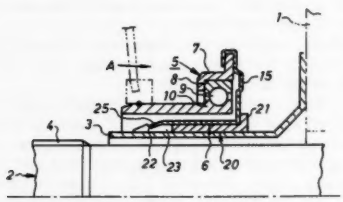
U.S. Cl. 192—110 B **2 Claims**

1. A clutch release bearing comprising:

a case unit containing a bearing main body, said case unit including an end flange portion and a tubular sleeve having a leading end opposite said end flange portion for supporting said bearing on a squill of a transmission housing; and

a bush interdisposed between said sleeve and said squill for slidably supporting said bearing main body thereon, said bush having an outer flange at one end and an annular groove near the other end forming a protrusion for engaging said sleeve leading end;

said bush having radial slits formed at said other end such that said end may be deformed inwardly to allow insertion



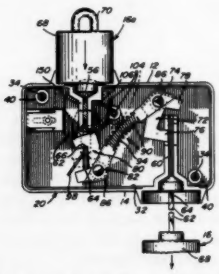
of said bush into and removal of said bush from said sleeve.

5,069,324

CHAIN LOCK FOR CARTS

Jean-Paul Lepage, 152, rang d'Argenteuil, Saint-Damase, Province of Quebec, Canada J0H 1J0 , and Robert Lepage, 332 Pierre Coté , Bois-des-Filion, Province of Quebec, Canada J6Z 4A2

Filed Apr. 23, 1990, Ser. No. 512,803
Int. Cl.[5] G07F *5/02, 17/00*
U.S. Cl. 194—212 **13 Claims**



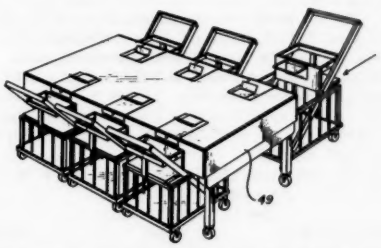
1. A locking device for interlocking a first and a second cart, comprising a first and a second key attachable to said first and second arts, respectively, a housing attachable to said first cart and having a first and a second key slot for receiving first and second keys, respectively, a two-state locking mechanism mounted in said housing and including a first and a second locking member associated with said first and said second key slots and each movable from a key-releasing position to a key-locking position upon key insertion in the associated slot, and locking members inter-connecting and position inverting means interconnecting said two locking members, said first and second locking members being in key-locking and key-releasing position, respectively, in the first state of said locking mechanism and in key-releasing position and in key-locking position, respectively, in the second state of said locking mechanism, whereby with said second key locked within said second key slot by said second locking member, insertion of said first key within said first key slot causes locking of said first key to said housing and release of said second key from said housing, further including a coin-receiving cavity in said housing, a coin feeler detecting the presence or absence of the coin in said cavity, a retainer movably mounted in said housing and controlled by said feeler for retaining said first locking member in said key-releasing position upon said feeler detecting the absence of a coin in said cavity and for freeing said first locking member for movement to said key-locking position upon said feeler detecting the presence of a coin in said cavity, and wherein said keys have identical key shafts capable of actuating either one of said locking members when inserted in the respective key slots.

5,069,325

COIN OPERATED SHOPPING CART RENTAL SYSTEM

David J. Schonberg, Rte. 3, Box 353, Alexandria, Minn. 56308, assignor to David J. Schonberg, Alexandria, Minn.

Filed Jul. 28, 1989, Ser. No. 386,510
Int. Cl.[5] G07F *17/00, 11/62*
U.S. Cl. 194—235 **11 Claims**



1. A rental system comprising a plurality of stations, each station being comprised of several locking mechanisms, each of said locking mechanisms releasably engaging and interlocking a locking element on a portable device, each of said locking mechanisms comprising,

a housing including an upper wall and outer walls, a plurality of similar coin openings in said upper wall, a locking opening in one of said outer walls for receiving the locking element on a portable device therein,

a plurality of locking members positioned within said housing and being shiftable between locking and release positions, said locking members when in the locking position engaging and retaining the locking element of a portable device when the locking element is moved into said locking opening,

a plurality of actuators shiftably mounted within said housing for shifting movement between a normal locking position and a release position, and being operatively interrelated with said locking members, each actuator including means for supporting a coin inserted into one of the coin openings, said actuators being shiftable in response to movement of the coins through the openings in the upper wall to shift the locking members to a release position and to thereby release the locking element on the portable device,

the coin on one actuator being retained thereon, each coin on the other of said actuators being displaced therefrom during shifting movement of the actuators, means in said housing engaging said one actuator for retaining the same in the release position, whereby when the locking element on a portable device is inserted into the locking opening in said housing, the locking element will cause said one actuator to return the coin thereon through the coin opening, and said locking members will engage the locking element on the portable device to thereby lock the portable device.

5,069,326

CONVEYOR MEANS

Shunji Sakamoto, and Toshihiko Hoshino, both of Hiroshima, Japan, assignors to Mazda Motor Corp., Japan

Filed Jul. 17, 1990, Ser. No. 554,034
Claims priority, application Japan, Jul. 20, 1989, 1-189524; Jul. 20, 1989, 1-189525; Jul. 20, 1989, 1-189526; Jul. 20, 1989, 1-189527; Jul. 20, 1989, 1-189528
Int. Cl.[5] B65G *35/00*
U.S. Cl. 198—619 **9 Claims**

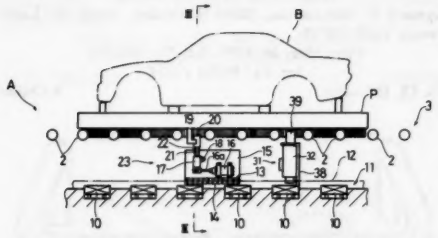
1. A conveyor means for conveying articles between stations of a line having a plurality of stations comprising:

a linear motor unit and a servomotor unit provided at each station;

conveying state detecting means for detecting conveying

state of an article being conveyed between adjoining stations; and

control means which receives output of said conveying state detecting means and controls working of said linear motor unit and said servomotor unit so that an article conveyed from one of said stations to an adjoining one of said stations is driven by both said linear motor unit and said servomotor unit in at least one of an acceleration region at an initial stage of conveyance and a deceleration region at a last stage of conveyance, and is driven by said servomotor unit in a fixed speed region at an intermediate stage of conveyance.



5,069,327

SHAVINGS CONVEYOR

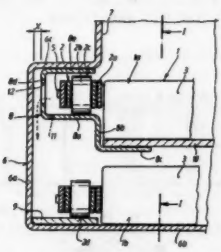
Albert Stöhr, Markt Schwaben, and Alfred Rehle, München, both of Fed. Rep. of Germany, assignors to Gebr. Hennig GmbH, Fed. Rep. of Germany

Filed Apr. 6, 1990, Ser. No. 505,408

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1989, 3913019

Int. Cl.[5] B65G *19/00*

U.S. Cl. 198—725 **9 Claims**



1. A shavings conveyor for use with machine tools, said conveyor comprising:

a conveyor means including an upper run and a lower run, forming a conveyor belt adapted to turn continuously, said upper run forming a shavings conveyor run, said conveyor means including first and second driven lateral conveyor chains each including an upper run and a lower run, said chains being mounted to spaced rollers,

a housing including substantially vertical sidewalls and a top wall and including guide rails therein spaced from said conveyor means for guiding said rollers of said upper run of each of said conveyor chains, said guide rails of said conveyor chains including openings therein for allowing liquid to pass therethrough, said guide rails extending in the region of a substantially vertical side wall of the housing, and wherein each guide rail is formed by a metal part which includes multiple bends in cross-section, said multiple bends comprising a flat guide section including an inner edge and an outer edge, each said flat guide section oriented at approximately a right angle to the vertical side walls and on which said rollers move along, a downwardly bent holding section extending downwardly from the inner edge of said flat guide section, which extends toward the lower run of the conveyor belt and which includes a lower edge, a wear plate fixed to the lower edge of said downwardly bent holding section and forming a conveying base for the upper run of the conveyor belt.

5,069,328

DOUBLE CENTRAL CHAIN BELT ASSEMBLY

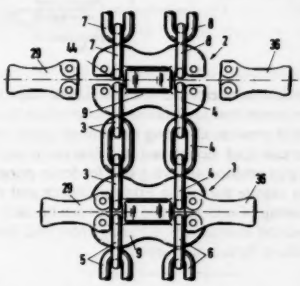
Dieter Schüpphaus, Castrop-Rauxel, and Hans D. Nowak, Herne, both of Fed. Rep. of Germany, assignors to Klöckner-Becorit GmbH, Castrop-Rauxel, Fed. Rep. of Germany

Filed Jun. 8, 1990, Ser. No. 535,120

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1989, 3918992

Int. Cl.[5] B65G *19/24*

U.S. Cl. 198—731 **18 Claims**



1. A double central chain belt assembly for a chain scraper conveyor, said assembly comprising scraper members arranged at spacings from each other and each comprising a central portion and two outside portions of the same configuration as each other, and chain portions connecting the scraper members together, each adjacent pair of scraper members being connected together by a pair of chain portions which are arranged at respective sides of the central line of the assembly, each end of each chain portion terminating in an end link which serves as a connecting link, wherein each central portion is releasably connected to its associated outside portions, each central portion has engagement surfaces disposed in opposite relationship to each other in the longitudinal direction of the assembly for engaging the teeth of a pin gear, each central portion has a flank on each side, said flanks are extended horizontal planar portions having recesses for connecting chain links and vertical bores for connecting means which connect a lateral pusher element having oppositely disposed openings for engaging the end links of the associated chain portions, and each flank is arranged to receive, and to be secured to, an associated outside portion.

5,069,329

PARTS FEEDER

Paul R. Smith, Ortonville; Orval F. Wolfgram, Saginaw, both of Mich., and Rudolph G. Kobelia, Homer, N.Y., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 112,502, Oct. 22, 1987, Pat. No. 4,988,256. This application Jun. 29, 1990, Ser. No. 555,331

Int. Cl.[5] B65G *47/00*

U.S. Cl. 198—752 **2 Claims**

1. A parts feeder for singulating a plurality of different unique parts, said feeder in combination comprising:

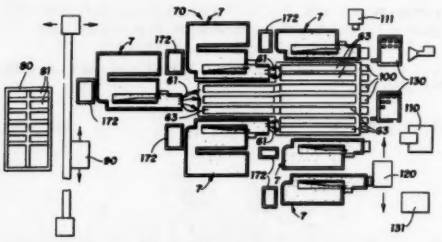
a vibrator means; and

a fabric oriented platform mounted onto said vibrator means, said platform including:

a load section in response to the vibrator means for accepting unique parts in bulk with fabric oriented to impart movement of said parts in a general first direction in response to the vibrator means;

a first compound inclined ramp section connectable to said load section and having fabric oriented to impart movement of said parts in a general second direction in response to the vibrator means and being inclined to cause non-singulated parts to fall and return to said load section;

a second drop off ramp for accepting singulated parts from said first ramp and with fabric oriented to impart movement to said singulated parts to a desired workstation; and



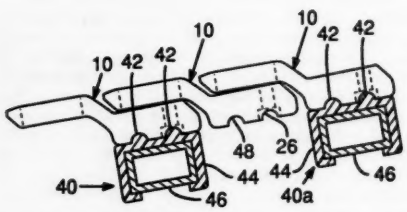
a gate mounted between said load section in response to the vibrator means and said inclined ramp whereby said gate in a closed position allowing said unique parts movement between said load section and said first ramp and said gate in said open position allowing said feeder to purge itself of said first unique part to an external source and thereafter the reclosing of said gate said feeder can be used to singulate a second unique part differing from said first unique part without further adjustment.

5,069,330

SIDE PLATE FOR A PLASTIC SPIRAL CONVEYOR BELT SYSTEM

Karl V. Palmaer, 108 Winding Canyon La., Folsom, Calif. 95630, and Eric K. Palmaer, 11749 Melones Cir., Gold River, Calif. 95670

Filed Nov. 30, 1990, Ser. No. 620,264
Int. Cl.[5] B65G *13/02*
U.S. Cl. 198—778 **4 Claims**



1. A side plate for a modular plastic conveyor belt in a spiral conveyor, comprising,

a molded plastic body having a pair of legs generally parallel and offset from one another, the two legs being connected by a central angled portion such that the two legs and the central angled portion define the length of the side plate,

one of the two legs being an outer leg for positioning at an edge of a modular plastic conveyor belt and having an outer surface which is adapted for engaging cage bars of a driving cage in a spiral conveyor system, and

the outer leg having a bore for receiving a connecting rod in an assembled modular conveyor belt and the bore including a countersink bore toward the outer surface of the leg sized to receive and recess a rod head of the connecting rod, and a groove formed generally vertically in the outer surface, transverse to the length of the side plate, with the groove extending across and being centered on the countersink bore,

whereby the groove in the side plate and in similar side plates in a series of such side plates in a plastic conveyor belt may be engaged by protruding elements of a driving cage to assist in driving engagement between the driving cage and the spiral conveyor belt.

5,069,331

HARVESTING CONVEYOR

Raymond G. Bartkowiak, 20806 S. Gridley, Space 48, Lakewood, Calif. 90715

Filed Mar. 26, 1990, Ser. No. 498,899
Int. Cl.[5] B65G *15/54*
U.S. Cl. 198—848 **8 Claims**

1. An improved link for a conveyor having a plurality of interconnected adjacent links with substantially uniform diameters comprising:

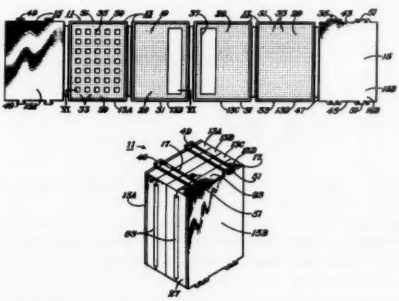
said link includes a cutout area where ware occurs between said interconnected adjacent links making up the conveyor, said cutout is filled with a lubricous material so that the overall diameters of said links including said filled cutout area remains substantially uniform.

5,069,332

JEWELRY BOX

Della H. Williams; Robert A. Williams, both of Fort Worth; Jeffrey W. Herron, Arlington, and Karen M. Britt, Fort Worth, all of Tex., assignors to Williams Instruments, Inc., Fort Worth, Tex.

Filed Feb. 22, 1990, Ser. No. 483,365
Int. Cl.[5] A45C *11/04*
U.S. Cl. 206—6.1 **16 Claims**



12. A jewelry box, comprising:

a plurality of racks, each rack comprising board means for supporting jewelry and two edge walls located at opposite edges of said board means,

each of said racks having first and second opposite facing sides,

two cover means,

at least two of said racks being end racks,

hinge means coupled to each of said edge walls of each of said racks for pivotally coupling said racks together in series and said two covers to said two end racks respectively whereby said racks and said two covers may be stretched out to an open position such that said racks and said two covers extend generally in the same plane,

said hinge means allowing said racks to be folded in a closed

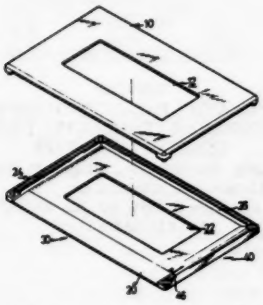
position where they are generally parallel to each other and said cover means to be folded next to said end racks, respectively.

5,069,333

NAMECARD HOLDER AND DISPENSER

Chien J. Chen, No. 12, Chungshan Rd., Tanshui Chen, Taipei Hsien, Taiwan

Filed Feb. 28, 1991, Ser. No. 661,349
Int. Cl.[5] A45C *11/18*; B65D *83/12*
U.S. Cl. 206—39.5 6 Claims



1. A namecard holder and dispenser, comprising:

a substantially rigid and rectangular body defined by: a first plate and a second plate with an inner chamber formed therebetween opening to a first side portion and a second side portion; a first opening in said first plate; and a second opening in said second plate;

an insertion means formed in said first side portion for guiding, in conjunction with a user's finger inserted through said second opening, a namecard into said chamber and for preventing a namecard within said chamber from falling out; and

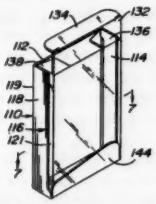
a dispensation means formed in said second side portion for guiding, in conjunction with a user's finger inserted through said first opening, only one namecard out of said chamber at a time.

5,069,334

CONTAINER

Melvin B. Herrin, Meadowbrook, and Richard Mazurek, Rockledge, both of Pa., assignors to Klearfold, Inc., Warrington, Pa.

Division of Ser. No. 526,028, Aug. 24, 1983, Pat. No. 4,858,756, which is a continuation of Ser. No. 271,359, Jun. 15, 1981, abandoned, which is a continuation-in-part of Ser. No. 175,404, Aug. 5, 1980, abandoned. This application Mar. 29, 1989, Ser. No. 330,070
The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.
Int. Cl.[5] B65D *25/00*
U.S. Cl. 206—45.34 23 Claims



1. A method of making a partially transparent container which can be shipped in a flat condition and set up by standard packaging machinery, comprising the steps of

a) determining the desired transparent and opaque portions of the container,

b) fabricating from a sheet of transparent plastic substantially rigid, self-supporting material a first portion of a container blank for forming at least a part of the desired transparent portion,

c) fabricating from a sheet of opaque substantially rigid, self-supporting material a second portion of the said container blank for forming at least a part of the desired opaque portion,

d) forming at least two discrete fold lines in said first portion so that they cooperate to form a walled enclosure when the container is in its setup condition, to form a substantially flat configuration when the container is in its fully collapsed condition, and which walled enclosure is movable between its setup condition and fully collapsed condition by movement of its said walls relative to each other, and

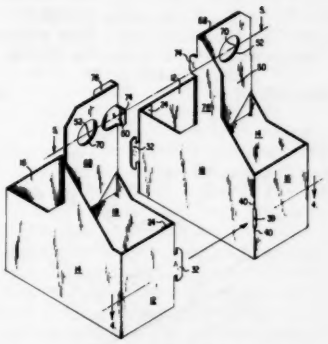
e) bonding the said first and second portions together to form a container which can be shipped in a flat condition and thereafter set up to form a container in which the desired transparent and opaque portions are at least partially defined by the cooperation of said first and second portions.

5,069,335

MODULAR ARTICLE CARRIER

Jonathan T. Beales, Philadelphia, Pa., assignor to International Paper Company, Purchase, N.Y.

Filed Jul. 23, 1990, Ser. No. 555,701
Int. Cl.[5] B65D *75/00*
U.S. Cl. 206—144 7 Claims



1. A modular two pack carrier, the carrier formed of a unitary blank of paperboard and having a generally rectangular basket portion having opposing side and end panels, a handle panel positioned above the basket portion, the handle panel having two overlapping panels each formed from a respective side wall of the carrier, the plane of said handle panel being transverse to the carrier side panels and parallel to the carrier end panels, one end of the basket portion of the carrier having a latching tongue, the other end of the basket portion of the carrier having a complementary latching recess, said latching tongue projecting beyond one side panel, whereby two of said two pack carriers can be latched together in side by side, tandem relation to form a four pack carrier.

5,069,336

CONTAINER HAVING COMPONENTS IN SEALABLE BLIND BORES FOR ANCHORING FASTENING ELEMENT

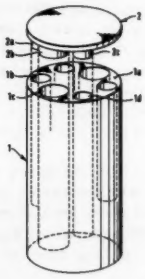
Peter Mauthe, Türkheim, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft

Filed Sep. 6, 1990, Ser. No. 578,784

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1989, 3929603

Int. Cl.[5] B65D *81/32*

U.S. Cl. 206—219 **7 Claims**



1. A container for a hardenable multi component mass used in anchoring a fastening member in a bore hole, said container has an axial direction with at least two closed chambers, said chambers being separate from one another and arranged to hold an individual component of the multicomponent mass, wherein the improvement comprises that said container comprises a container body formed of a destructible material, said chambers are formed by said container body and have axes extending approximately parallel to the axial direction and to one another, said chambers and the axes thereof are in spaced relation, and said chambers are formed as sealable blind bores in said container body.

5,069,337

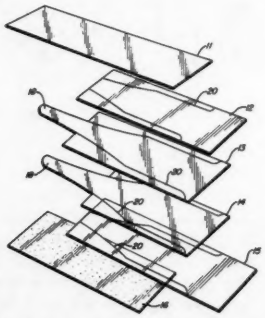
BITE-RESISTANT SHEATH FOR PROBE

Harry Bala, 7 Corey Dr., S. Barrington, Ill. 60010

Continuation of Ser. No. 388,701, Aug. 2, 1989, abandoned. This application Jul. 16, 1991, Ser. No. 731,306

Int. Cl.[5] B65D *85/38*

U.S. Cl. 206—306 **33 Claims**



16. In a sheath for a probe which comprises a flattened probe sheath having an open end and a closed end, said sheath defining a pair of peripherally connected, flat sides, the improvement comprising, in combination:

each flat side of said sheath defining at least a portion, positioned at least intermediate the sheath ends, which portion comprises permanently laminated plastic sheeting comprising inner and outer plastic layers, said inner plastic layer being made of a material readily heat sealable with itself and the material of the outer plastic layer, the outer plastic layer being of greater penetration strength than said inner layer and sealingly compatible therewith, whereby said sheath is capable of substantially preventing bite-through in human mouths when enclosing a probe, said flat sides being connected together by a heat seal line to define said sheath, said laminated inner and outer plastic layers extending substantially the entire length of said sheath.

5,069,338

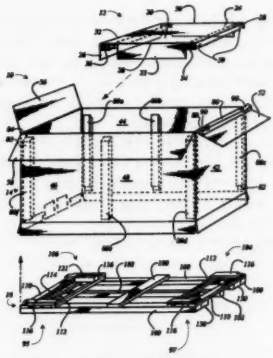
SUPPORT PAD AND A PALLET WITH SOCKETS FOR A WOOD REINFORCED CORRUGATED PAPERBOARD SHIPPING CONTAINER

John M. Grigsby, Marietta, Ga., assignor to North American Container Corporation, Mableton, Ga.

Filed Sep. 6, 1989, Ser. No. 403,747

Int. Cl.[5] B65D *85/68*

U.S. Cl. 206—319 **8 Claims**



1. A wood reinforced corrugated container, comprising:

a pallet for supporting an article to be packed;

a corrugated paperboard body which attaches at a bottom end to the pallet, comprising a blank of corrugated paperboard scored for folding to provide a two opposing side walls and two opposing end walls, a plurality of vertically disposed spaced apart cleats attached to the two side walls, and a plurality of top flaps each joined along a respective second score line to a separate one of the walls and foldable normal to the wall to close the container;

a first rigid member disposed normal between the side walls and supported at its longitudinal ends by one of the cleats on each of the side walls;

a second rigid member disposed normal between the side walls and supported at its longitudinal ends by one of the other cleats on each of the side walls; and

a sheet of semi-rigid material attached to an upper surface of each of the first and second rigid members;

a third rigid member attached to the top flap of one of the end walls and disposed parallel to the respective second score line,

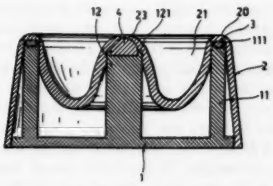
wherein the longitudinal ends of the third rigid member contacts one of the other cleats on each of the side walls for support when the top flap is folded to partially close the container.

5,069,339

STRUCTURE OF CLIP CONTAINER

Nick Hsu, 5 F, No. 44, Alley 3, Lane 550, Min Chuan E. Rd., Taipei, Taiwan

Filed Dec. 13, 1990, Ser. No. 627,144
Int. Cl.[5] B65D *83/00*
U.S. Cl. 206—340 12 Claims



1. A clip container for holding clips or small metal accessories comprising a casing mounted on a base, said casing having an annular top edge around a periphery thereof defining therein a concave surface portion, said concave surface portion having a hollow conical projection at a center thereof; said base having a raised wall around a periphery thereof and a unitary post at a center thereof for respectively supporting said annular top edge and said hollow conical projection, said raised wall having an annular groove on a topmost edge thereof with a magnetic element fastened thereto and abutting an inner bottom surface of said annular top edge for providing a magnetic force for attracting the clips moved from said concave surface portion toward said annular top edge.

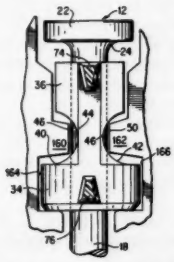
5. A clip container for holding clips or small metal accessories comprising a casing mounted on a base, said casing having an annular top edge around a periphery thereof defining therein a concave surface portion, said concave surface portion having a hollow conical projection at a center thereof; said base having a raised wall around a periphery thereof and a unitary post at a center thereof for respectively supporting said annular top edge and said hollow conical projection, said post having a circular groove on a topmost edge thereof with a magnetic element fastened thereto and abutting against a topmost inner bottom surface of the hollow conical projection for providing a magnetic force for attracting the clips moved from said conical surface portion toward said hollow conical projection.

5,069,340

STRIP OF COLLATED FASTENERS FOR FASTENER-DRIVING TOOL

Richard J. Ernst, Rolling Meadows; Don T. Van Allman, Palatine; Harish C. Gupta, Downers Grove; Michael C. Dill, Elk Grove Village, and Martin J. Nilsen, Hampshire, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Mar. 5, 1991, Ser. No. 664,754
Int. Cl.[5] B65D *85/24;* B25C *1/00*
U.S. Cl. 206—347 14 Claims



1. A strip of collated fasteners, the strip comprising a plurality of fasteners and a carrier molded from a polymeric material, each fastener having an elongate shank with a pointed end and a head and being designed to be forcibly driven through a workpiece, into a substrate, the shank having a portion flaring outwardly where the shank adjoins the head, the carrier comprising a separate sleeve associated with each fastener, a representative sleeve including an annular portion and a breakable portion integral with the annular portion, the representative sleeve gripping the shank of the associated fastener with the annular portion nearer to the pointed end of the shank of the associated fastener and with the breakable portion nearer to the head of the associated fastener, the breakable portion having an end opposite to the annular portion and having a pair of similar laterally opposed, outwardly opening, continuously curved, concave recesses shaping the breakable portion so that the breakable portion constitutes means for breaking into at least two segments, approximately along a vertical plane bisecting each of the concave recesses, when the outwardly flaring portion of the shank of the associated fastener bears against said end of the breakable portion as the associated fastener is being driven forcibly through a workpiece, into a substrate, after the annular portion has been arrested by the workpiece, the annular portion constituting means for eliminating any gap between the head of the associated fastener and the workpiece after the associated fastener has been driven, the respective segments tending to remain integral with the annular portion after the associated fastener has been driven, the carrier comprising frangible bridges between adjacent ones of the sleeves of the carrier.

9. A strip of collated fasteners, the strip comprising a plurality of fasteners and a carrier molded from a polymeric material, each fastener having an elongate shank with a pointed end and a head and being designed to be forcibly driven through a workpiece, into a substrate, the carrier comprising a separate sleeve associated with each fastener, a representative sleeve including a lower, annular portion and an upper portion integral with the annular portion, the representative sleeve gripping the shank of the associated fastener with the lower, annular portion nearer to the pointed end of the shank of the associated fastener and with the upper portion nearer to the head of the associated fastener, the upper portion having at least one outwardly opening, curved, concave recess having an open window, from which a portion of the shank of the associated fastener emerges, the carrier comprising frangible bridges between adjacent ones of the sleeves of the carrier.

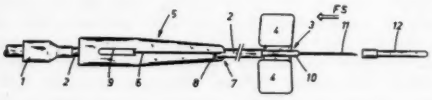
11. In a fastener-driving tool, a combination comprising a strip of collated fasteners and means for guiding the strip of collated fasteners longitudinally, the strip comprising a plurality of fasteners and a carrier molded from a polymeric material, each fastener having an elongate shank with a pointed end and a head and being designed to be forcibly driven through a workpiece, into a substrate, the carrier comprising a sleeve associated with each fastener, a representative sleeve including a lower, annular portion and an upper portion integral with the annular portion, and gripping the shank of the associated fastener with the lower, annular portion nearer to the pointed end of the shank of the associated fastener and with the upper portion nearer to the head of the associated fastener, the upper portion having an upper end and having a pair of similar, laterally opposed, outwardly opening, continuously curved, concave recesses, each concave section having an open window, from which a portion of the shank of the associated fastener emerges, the emerging portions being opposed diametrically, the carrier comprising frangible bridges between adjacent ones of the sleeves of the carrier, the guiding means comprising a pair of parallel ribs, each rib fitting into a respective one of the concave recesses of at least one sleeve of the carrier, into close proximity with the emerging portions of the shanks gripped by the last-mentioned sleeve, so as to guide the strip of collated fasteners between the parallel ribs, which are spaced from each other so as to permit the strip of collated fasteners to move along and between the parallel ribs.

5,069,341

DISPOSABLE SINGLE-USE DRIP-FEED DEVICE WITH A COVER FOR THE NEEDLE AFTER USE

Giuseppe Barbieri, Via Pieve del Pino, 38 Sasso Marconi (Bologna), Italy 40037 ; Deanna Bordini, Via Grazia Deledda, 2 Montale di Castelnuovo Rangone (Modena), and Luciano Gatti, Via Grazia Deledda, 4 Montale di Castelnuovo Rangone (Modena), both of Italy 41051

Filed Apr. 22, 1991, Ser. No. 689,169
Claims priority, application Italy, May 29, 1990, 3525 A/90
Int. Cl.[5] B65D *85/24*
U.S. Cl. 206—365 4 Claims



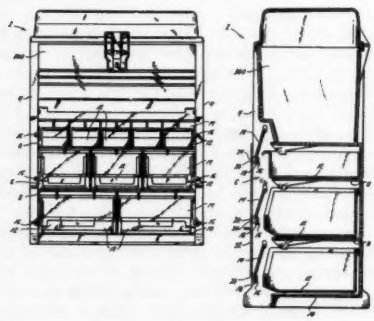
1. Single-use drip-feed device with a cover for the needle after use, comprising, in this order, and communicating and irremovably joined together, a connector (1) linkable to a feed tube supplying a drip-feed liquid, a narrow tube (2) and a needle (3) having two diametrically opposite flexible tabs (4) for handling, wherein over the narrow tube (2) is fitted, in a freely sliding manner, a tubular cover (5) which has, at the extremity (7) towards the said needle (3), a pair of longitudinal slots (6) on opposite sides with respect to its longitudinal axis; the said slots (6) are of a length such that, when the said tabs (4) approach the closed ends of the said slots (6), the point of the needle (3) is completely contained within the said tubular cover (5); this being made of a material which is sufficiently hard to prevent the point of the needle (3) from piercing it, yet at the same time, sufficiently elastic to permit insertion of the said tabs (4) into the said slots (6).

5,069,342

COMBINATION TOOL BOX/ORGANIZER

Thomas Dickinson, St. Louis, Mo., assignor to Contico International, Inc., St. Louis, Mo.

Filed Aug. 13, 1990, Ser. No. 566,174
Int. Cl.[5] B65D *85/00*
U.S. Cl. 206—372 6 Claims



1. A combination tool box/organizer comprising;
a frame, the frame having slots formed therein with openings in the frame providing access to the slots;
a tool box section supported on the frame;
an organizer section supported on the frame, the organizer section including at least two shelves supported by the frame and at least two bins supported on each shelf for sliding movement forward and backward on each shelf, and including front covers supported on the frame in positions in front of the bins, the front covers having pins that pass through the openings in the frame and engage in the slots; and,
a lock mechanism bar supported on the frame for movement relative to the slot openings, the bar being movable to cover the openings to lock the front cover pins in the slots and thereby lock the front covers in position in front of the bins.

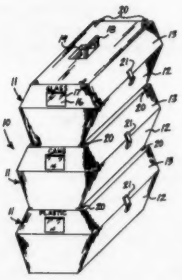
6. A combination tool box/organizer comprising:
a frame, the frame having slots formed therein with openings in the frame providing access to the slots, the slots extending in a general downward direction relative to the frame;
a tool box section supported on the frame;
an organizer section supported on the frame, the organizer section including at least one shelf supported by the frame and at least one bin supported on the shelf for sliding movement forward and backward on the shelf, and including a front cover supported on the frame for both pivoting movement of the front cover relative to the frame and for translatory movement of the front cover relative to the frame, the front cover having at least one pin that passes through one of the slot openings and engages in one of the slots in response to pivoting movement of the front cover relative to the frame, and the front cover fin moves downward relative to the slot to a position where the pin is retained in the slot in response to translatory movement of the front cover relative to the frame;
a lock mechanism bar supported on the frame for movement relative to the slot opening, the bar being movable to cover the slot opening to lock the front cover pin in the slot and thereby lock the front cover in a position in front of the bin.

5,069,343

STACKABLE RECYCLING STORAGE BIN APPARATUS

Jerry A. Markle, 2218 Farnsworth Rd., Lapeer, Mich. 48446

Filed Nov. 29, 1990, Ser. No. 619,389
Int. Cl.[5] B65D *17/34*
U.S. Cl. 206—508 5 Claims



1. A stackable recycling storage bin apparatus comprising, in combination,
a plurality of storage bin members, the storage bin members mounted in a vertical orientation relative to one another in a stacked vertical column, each storage bin member includes a lower storage container defined by a first trapezoidal cross-sectional configuration and defined by a predetermined length, and
a lid member defined by the predetermined length and formed of a second trapezoidal configuration less than the first trapezoidal configuration to orient a center of gravity of an empty bin member within the container of each bin member, and
each storage container including a continuous container upper edge complementarily configured to a continuous lid lower edge, and
a pivotal door mounted within a forward wall of the lid

member, the pivotal door including a spring hinge to bias the door in a vertical orientation in alignment with the forward wall of the lid member, and

positioning means mounted fixedly to a top wall of the lid member to position and orient an overlying storage container thereon of the plurality of bin members.

5,069,344

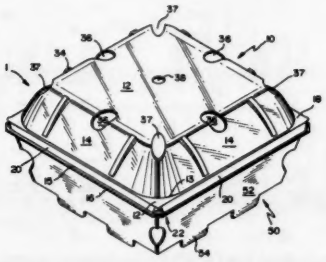
BERRY BASKET AND COVER

David L. Dehart, San Jose, Calif., assignor to Plexiform, Incorporated, Milpitas, Calif.

Division of Ser. No. 532,754, Jun. 4, 1990. This application Mar. 15, 1991, Ser. No. 669,950

Int. Cl.[5] B65D *21/02*

U.S. Cl. 206—508 **10 Claims**



1. A stackable container including a basket having a bottom and an open top and a cover for the basket, said cover having a top portion and side wall means extending outwardly and down from said top portion to a rim defining an opening in the cover, a plurality of ribs on said cover, each of said ribs extending from a point on said side wall means adjacent said rim to an apex presenting a basket engaging surface, said basket engaging surfaces extending to said apex from points on said cover surface defining a boundary area corresponding to the shape and area of the bottom of the basket, said ribs and basket engaging surfaces being positioned on said cover to receive and hold a basket therebetween for stacking one container on top of another container.

5,069,345

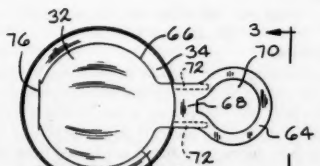
PLASTIC CONTAINER WITH TEAR OPENING FEATURE

Christopher Irwin, Adrian, Mich., assignor to Hoover Universal, Inc., Plymouth, Mich.

Filed Sep. 24, 1990, Ser. No. 587,085

Int. Cl.[5] B65D *41/32*

U.S. Cl. 220—270 **6 Claims**



1. A recyclable single service container comprising:

an upright hollow plastic body having a mouth at its upper end, a plastic tear open closure cap mounted on said body at said mouth, said closure cap having upper and lower surfaces and generally corresponding in shape to the shape of the said mouth, sealing means on said lower surface engaging said mouth to form a seal therearound and retain the contents of said hollow body therein, said closure cap being fixedly secured to said hollow body causing continual engagement of said mouth and said sealing means;

a tear strip being defined in said closure cap by two grooves and extending at least partially thereacross, said tear strip cooperating with said sealing means and said closure cap to seal said container thereby retaining the contents disposed therein; and

a pulling member integrally formed with said tear strip adjacent said two grooves and extending therefrom, means for enabling gripping of said pulling member being provided thereon, a weakened area being formed at an end of said two grooves adjacent said pulling member to facilitate the tearing of said tear strip along said two grooves upon the application of a pulling force to said pulling member thereby opening said container and permitting the dispensing of the contents therefrom, said tear strip remaining attached to said closure cap after opening allowing said closure cap and container to be recycled together.

5,069,346

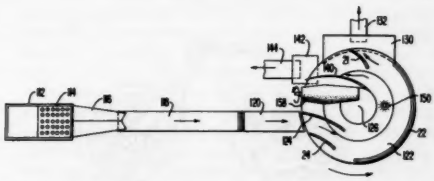
METHOD AND APPARATUS FOR FRICTION SORTING OF PARTICULATE MATERIALS

Carl W. Nicols, Sylacauga, Ala.; Michael J. Lorang; Michael O. Wold, both of Bozeman, Mont., and Jerry W. Rayfield, Sylacauga, Ala., assignors to Cyprus Mines Corporation, Englewood, Colo.

Continuation-in-part of Ser. No. 325,145, Mar. 19, 1989, abandoned, continuation of PCT/US88/02814 on Aug. 18, 1988 which is a continuation-in-part of Ser. No. 97,877, Sep. 19, 1987, abandoned. This application Mar. 31, 1989, Ser. No. 331,175 Sep. 19, 1987, abandoned. This application Mar. 31, 1989, Ser. No. 331,175

Int. Cl.[5] B07B *9/00*

U.S. Cl. 209—700 **20 Claims**



1. A method of separating on a rotatable plate member having a separating surface thereon a mixture of two or more discrete, rocklike particulate materials of disparate composition on the basis of material composition, comprising the steps of:

providing said separating surface with a surface material that manifests a different sliding coefficient of friction between the respective mixture materials;

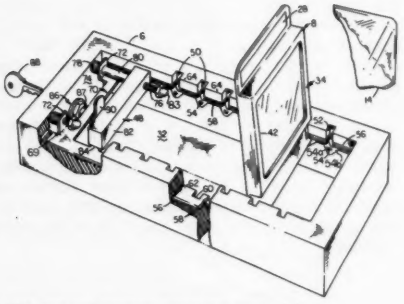
rotating said separating surface to impose centrifugal forces on said mixture materials whereby said materials tend to radially traverse said surface at different centrifugally-induced velocities;

placing said mixture of materials on said separating surface at a velocity substantially equal to the tangential velocity of said separation surface that the point of deposition of said materials whereby the relative velocity between the mixture materials and said separation surface of such point is substantially zero;

separating said discrete materials of said mixture on the basis of the velocity differences therebetween; and

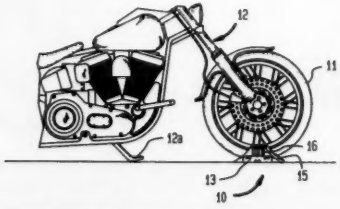
collecting the separated materials.

5,069,347
LOCKING COIN DISPLAY HOLDER
Anthony E. Newman, 2340 Horizon Cir., Shakopee, Minn. 55379
Filed Jun. 11, 1990, Ser. No. 536,327
Int. Cl.[5] A47F 7/00
U.S. Cl. 211—4 18 Claims



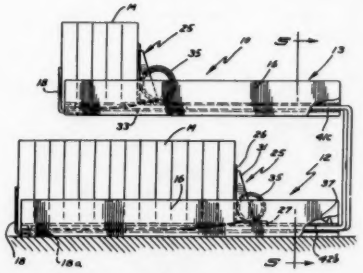
1. Display and storage apparatus comprising:
(a) a multi-walled tray;
(b) a plurality of holder means each including a frame portion for removably receiving and restraining a display item thereto and whereby at least one surface of the display item is viewable;
(c) means for coupling each of said holder means in pivotal, removeable relation to said tray; and
(d) lockable restraint means for selectively securing each of said holder means to said tray.

5,069,348
MOTORCYCLE CLEANING AID
Edward A. Long, 244 E. First Ave., Roselle, N.J. 07203
Filed Aug. 15, 1989, Ser. No. 394,230
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—24 23 Claims



1. A portable wheel tool comprising,
a. a base member having a first side, a second side, a front and a rear, wherein said base member is thin and light i weight so that it is easily transportable from place to place;
b. wheel support means disposed between said first side and said second side of said base member for supporting a wheel of a vehicle, said wheel support means being so constructed and arranged to permit the free rotation of the wheel towards the front or rear of said base member without moving the vehicle; and
c. side support means extending upwardly from said first side of said base member for providing additional support to the wheel of the vehicle, said side support means being positioned at an outwardly extending angle with respect to an imaginary vertical plane through said first side of said base member and being adapted to engage a side portion of the wheel when the vehicle is resting on the support means, said side support means being so constructed and arranged to permit the free rotation of the wheel toward the front or rear of said base member without moving the vehicle.

5,069,349
DISPLAY RACK STRUCTURE
Philip A. Wear, 5900 Carter La., Minnetonka, Minn. 55343, and Stuart C. W. Wear, 5636 Rebecca La., Minnetonka, Minn. 55344
Continuation-in-part of Ser. No. 541,040, Jun. 20, 1990, abandoned. This application Oct. 9, 1990, Ser. No. 594,721
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—59.3 11 Claims

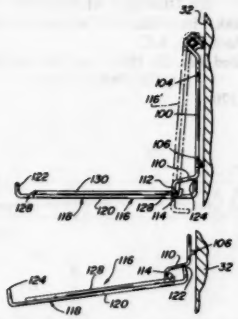


1. A multi-level shelf display structure comprising,
a base rack having a bottom wall, side walls and a front wall,
longitudinal transversely spaced ribs extending upwardly of said bottom wall,
a ram member comprising an upstanding plate having a supporting base,
said base being seated upon said ribs,
means slidably interengaging said base and said ribs,
means connecting said ram member and said base automatically urging said ram member forwardly of said base,
a channel at each side of said rack,
a second rack of the structure of said first mentioned rack spaced thereabove,
supporting means maintaining said racks in spaced relation,
said supporting means having vertically spaced forwardly extending arms, and
said arms being respectively frictionally disposed into said channels of said racks.

5,069,350
BACKSPLASH SYSTEM
Robert A. Wolff, Middleburg, and John F. Troxell, Jr., Northumberland, Pa., assignors to Wood-Mode, Incorporated, Kreamer, Pa.
Filed Nov. 28, 1989, Ser. No. 442,029
Int. Cl.[5] A47F 5/08
U.S. Cl. 211—87 10 Claims

1. A system adapted to support items normally used in the kitchen, said system being mountable on a generally vertically oriented surface, and comprising a rail having a longitudinal axis, means for mounting said rail on the generally vertically oriented surface, supporting means suspended from said rail in a vertical orientation immediately adjacent said vertically oriented surface and having an upper portion for placement about said rail, said rail comprising face means cooperating with said upper portion of said supporting means to prevent the rotation of said upper portion of the supporting means about said longitudinal axis of said rail, and said supporting means having holding means for holding an object thereon, said object holding means comprising a rack, said rack comprising means for enabling said rack to be mounted to said support means so as to be alternately positioned in either a

horizontal orientation or an inclined orientation and being adapted to serve the function of being a cooling rack when it



is suspended from said rail in said horizontal orientation and adapted to be a cookbook holder when it is suspended from said rail in said inclined orientation.

5,069,351

INFANT NURSING APPARATUS

Thomas Gunderson, and Barbara A. Gunderson, both of 9600 Xylon Ave. S., Bloomington, Minn. 55438

Filed Dec. 5, 1990, Ser. No. 622,626
Int. Cl.[5] A61J *9/06, 9/08*
U.S. Cl. 215—11.1 **4 Claims**

1. An infant nursing apparatus comprising, in combination,

an outer container mounting an inner container therewithin, the inner and outer containers are coaxially aligned in an assembled configuration along a common axis, and

a nursing means securably mounted to the inner container for effecting nursing of an infant, and

a cover member including a lower end portion with means for frictional securement to the nursing means, and

wherein the inner container is defined by a first diameter and the outer container is defined by a second diameter, wherein the second diameter is greater than the first diameter as measured at a common point along the common axis, and the inner container includes a main body portion with a first externally threaded portion defined by a first threaded diameter from the upper terminal end of the body portion, and the outer container including an internally threaded collar having an internal diameter equal to the first threaded diameter to permit selective securement of the first externally threaded portion within the internally threaded collar, and a spout coaxially projecting above the first externally threaded portion, with the spout including a second externally threaded portion defined by a second threaded diameter, wherein the second threaded diameter is less than the first threaded diameter, and the nursing means is selectively securable to the second externally threaded portion, and

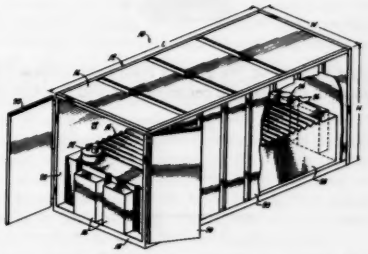
including a flexible sheet, the flexible sheet includes indicia thereon relative to the nursing event, wherein the flexible sheet is positioned in an enclosed chamber formed between the inner container and the outer container, and the inner and outer containers are transparent.

5,069,352

TRANSPORTABLE CARGO CONTAINER

Bruce A. Harbolt, Northridge, and Perry L. Murata, Torrance, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 429,604, Oct. 31, 1989, abandoned.
This application May 15, 1991, Ser. No. 701,585
Int. Cl.[5] B65D *87/00*
U.S. Cl. 220—1.5 **19 Claims**



1. A transportable combination cargo container for a liquid cargo which comprises:

a single unitary inner and a single outer container;

said outer container comprising a solids shipping container having a substantially rectangular floor member, a substantially rectangular roof member, and wall members extending therebetween, said members defining an enclosure, access means located in one of said members of said outer container for the introduction and removal of said inner container, and means adjacent said floor member of said outer container for removable attachment to a vehicle;

said inner container being a substantially rigid structure having a top member, a bottom member and side members extending therebetween defining an enclosure for containing bulk volumes of said liquid, an opening adjacent an upper portion of said enclosure for the introduction and withdrawal of said liquid cargo, at least two of the side members and the bottom members of said inner container being in close proximity to an inner surface of adjacent members of said outer container for receiving support from said outer container, and a plurality of circumferentially extending rib members which extend inwardly into said enclosure for dampening wave motion of cargo contained therein; and

closure means for sealing said opening in said inner tank.

5,069,353

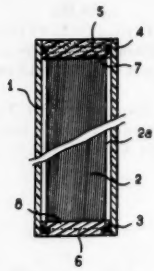
HOUSING FOR FIBER-BUNDLE FILTER MODULES

Jean-Michel Espenan, Toulouse, France, assignor to Lyonnaise Des Eaux, Paris, France

Filed Nov. 14, 1989, Ser. No. 436,320
Claims priority, application France, Nov. 21, 1988, 88 15099
Int. Cl.[5] B65D *85/00*
U.S. Cl. 220—4.01 **7 Claims**

1. An axially-extending and circumferentially-closed hollow housing made of substantially rigid material for a hollow fiber filter module, a perforated sleeve of substantially rigid material containing hollow fibers received therein, said housing including both an abutment ring disposed in the interior of said housing with an inwardly projecting horizontal section close to that end of said housing which will be the bottom end after said module has been mounted vertically, and a centering ring

adjacent the opposite end of said housing, the width of said centering ring corresponding to the gap between said housing and said sleeve, said sleeve being secured within said housing



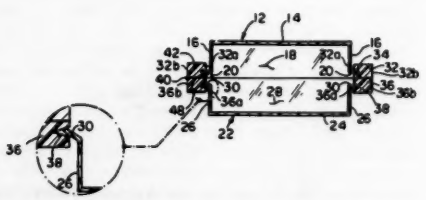
by potting said sleeve, the potting resin being disposed about said abutment ring and said centering ring and penetrating said sleeve.

5,069,354

OPENABLE/CLOSEABLE CONTAINER INCLUDING A FRAME FOR SUPPORTING A PAIR OF TRAY MEMBERS

Michael A. Tannenbaum, Freehold, N.J., assignor to Delvo Industries, Inc., Ivyland, Pa.

Filed Apr. 19, 1990, Ser. No. 511,485
Int. Cl.[5] B65D *6/00*
U.S. Cl. 220—4.22 **21 Claims**



1. An openable/closeable container comprising:

a first frame member having an inner surface and an outer surface, said first frame member including a groove in said inner surface extending towards said outer surface for releasably receiving a flange of a first tray member therein, such that said first frame member releasably supports said first tray member; and

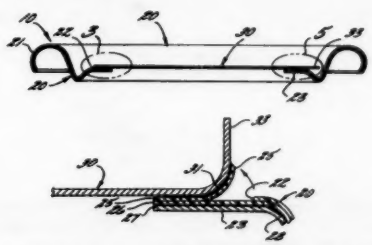
a second frame member having an inner surface and an outer surface, said second frame member including a groove in said inner surface extending towards said outer surface for releasably receiving a flange of a second tray member therein, such that said second frame member releasably supports said second tray member, said first and second frame members being hingedly connected together for allowing the first and second frame members to pivot between a closed position in which the frame members engage each other to provide a generally closed container and an open position in which the frame members do not engage each other and access is provided to the tray members.

5,069,355

EASY-OPENING COMPOSITE CLOSURE FOR HERMETIC SEALING OF A PACKAGING CONTAINER BY DOUBLE SEAMING

John J. Matuszak, Hartsville, S.C., assignor to Sonoco Products Company, Hartsville, S.C.

Filed Jan. 23, 1991, Ser. No. 644,889
Int. Cl.[5] B65D *17/34*
U.S. Cl. 220—270 **11 Claims**



1. An easy-opening closure for hermetic sealing of the open end of a packaging container and comprising:

a composite end member of desired construction for being double-seamed to the open end of the container and having an interior ledge portion defining a large central opening to allow access therethrough to the interior of the container, said composite end member including at least two polymer layers defining a predetermined peel strength at an interfacial plane thereof for controlled delamination of said two layers and a formable substrate layer bonded to the bottom one of said polymer layers and adapting said composite end member to be double-seamed to the container, said composite end member having a notch cut into the top one of said polymer layers in said ledge portion and spaced from and surrounding said central opening; and

a lidding member of desired configuration covering said central opening and having a portion overlapping said ledge portion and bonded to said top polymer layer in said composite end member to define a predetermined bond strength greater than said peel strength of said two polymer layers of said composite end member;

whereby, the force required to open said closure from the inside of the container when double-seamed to the container is greater than the force required to open said closure from the outside of the container since said closure is easily-opened by upwardly pulling of said bonded overlapping portion of said lidding member to cause delamination and peeling of the portion of said top polymer layer bonded to said lidding member from said bottom polymer layer beginning at said notch and continuing to said central opening.

5,069,356

EASY OPEN END WITH TEMPORARY RETENTION CENTER FOR SAFETY PURPOSES

Edgar H. Zysset, St. Cloud, Fla., assignor to Automated Container Corporation, Plymouth, Fla.

Filed Nov. 8, 1990, Ser. No. 611,692
Int. Cl.[5] B65D *17/40, 51/44*
U.S. Cl. 220—276 **11 Claims**

1. An easy open end for pressurized containers, comprising:

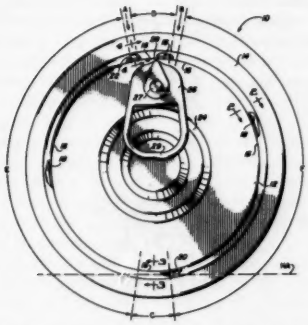
an end panel;

a score line extending along a curved path about at least a portion of the periphery of the end panel, the score line defining a removable inside portion severable from a remaining outside portion of the end panel;

means along a first side of the end panel for severing the score line;

means including a weakened area coextensive with the score

line along a second side of the end panel generally opposite the first side for temporarily retaining the second side with the outside portion as the first side moves outwardly away from the container during either inadvertent or intentional opening of the end; and wherein



the curved score line has a first depth through the end panel, and wherein the weakened area comprises a second score line having a substantially shallower depth than the first depth.

5,069,357

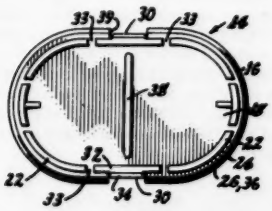
PANEL FOR ANIMAL TRUCK VENTILATION PORTS

Jack R. Anderson, P.O. Box 335, Darlington, Ind. 47940

Filed Jul. 16, 1990, Ser. No. 553,241

Int. Cl.[5] B65D *39/00*

U.S. Cl. 220—307 **6 Claims**



1. A closure panel for releasably closing a ventilation port in a wall of an animal-carrying vehicle, the closure panel comprising:

a sheetlike body member having a first sideface which when the body member is installed on the vehicle wall faces a first direction transversely of the vehicle wall, and a second sideface which when the body member is installed on the vehicle wall faces a second direction transversely of the vehicle wall;

the body member having a peripheral rib extending substantially continuously peripherally along and from the first sideface of the body member in the first direction; and

the peripheral rib being inwardly of the outer edge of the body member, providing that the edge portion of the body member, between said rib and the outer edge of the body member, provides a peripheral flange;

the peripheral rib being of a size and shape to locate the body member into operable registry with the wall port as to be insertable therein, by installation procedure including movement of the body member in the first direction into the vehicle's ventilation port;

said movement of the body member causing the peripheral rib to move to an installed position in which it has crossed past the wall port edges;

the peripheral flange, extending between the peripheral rib and the body member's edge, being such that when the body member is moved into said installed position, the peripheral flange will overlie the wall port edges;

opposite portions along only a substantially small portion of the said peripheral rib being provided each with an abutment lug extending outwardly from the rib, generally parallel to the body means, an amount sufficient that at least one of the abutment lugs, prior to the said installation procedure, will not pass the adjacent portion of the wall port edge but it is able to pass the adjacent portion of the wall port edge by an installation procedure in which the user applies force to the said rib and/or abutment lug sufficient to achieve resilient deformation of the abutment lug and/or of the portion of the peripheral rib which is adjacent the abutment lug;

the abutment lug, after being thusly caused to pass the wall port edge, thus providing an abutment retaining the body member by blocking the body member against movement of the body member in the second direction away from the wall port, and the said peripherally extending flange is retaining the body member by blocking the body member against movement of the body member in the first direction away from the wall port;

in a combination in which the peripheral rib is made discontinuous at locations adjacent the rib portion from which the abutment lug extends, providing that the resilient deformation needed to be imposed upon the peripheral rib, in the installation procedure, need be only that of the peripheral rib between the said locations; and

the combination being such that the peripheral flange is made to be discontinuous in the region of the abutment lugs, thus accommodating the presence of a tool to be applied directly against the abutment lug, and/or the adjacent portion of the peripheral rib which carries the abutment lug, in the installation procedure of forcing the abutment lug into its panel-retaining position.

5,069,358

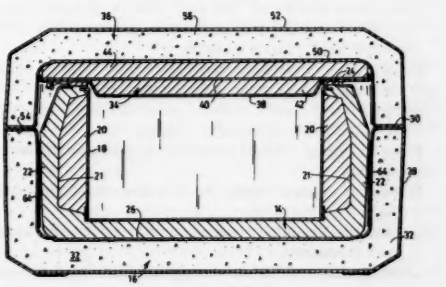
MEDIA CASE

Roland M. Avery, Jr., Pittsford, N.Y., assignor to John D. Brush & Co., Inc., Rochester, N.Y.

Filed Jan. 3, 1991, Ser. No. 637,294

Int. Cl.[5] B65D *6/10, 25/14*

U.S. Cl. 220—426 **39 Claims**



1. In a fire-resistant enclosure for protecting temperature sensitive articles in which a body of the enclosure includes: an inner repository made of a heat-conducting material for containing the temperature sensitive articles; slabs made of a phase-changing material positioned adjacent to outer surfaces of said inner repository; a layer made of a heat-insulating material encasing said inner repository and said slabs of phase-changing material; a layer made of a moisture-resistant material encasing said layer of heat-insulating material; a layer made of a water-bearing material encasing said layer of moisture-resistant material; and an outer skin of said enclosure body encasing said layer of water-bearing material; the improvement in which:

said layer of moisture-resistant material and said outer skin of the enclosure body are molded from an integral resin body having inner and outer shells separated by a space that is filled with said water-bearing material; said inner shell of the resin body forming said layer of moisture-resistant material; said filled space of the resin body forming said layer of water-bearing material; and said outer shell of the resin body forming said outer skin of the enclosure body.

14. A heat and moisture resistant enclosure for protecting electronic storage media comprising:

a main body of the enclosure formed in part by a first integrally molded body made of resin material having inner and outer shells separated by a space that is filled with a water-bearing material;

a cover for said main body of the enclosure formed in part by a second integrally molded body made of resin material having inner and outer shells separated by a space that is filled with a water-bearing material;

integrally molded jambs between said inner and outer shells of each of said first and second bodies for forming an outer seal between said main body and said cover;

said main body also being formed by an inner repository made of a heat-conducting material, a slab made of a phase-changing material positioned adjacent to said inner repository, and a layer made of a self-skinning foam molded about said inner repository and said slabs of phase-changing material; and

said layer of self-skinning foam being molded in a form that may be inserted into a cavity formed within said inner shell of said first integrally molded body and that extends beyond an open end of said inner repository forming part of an inner seal between said main body and said cover.

27. A method of making a main body of a fire-resistant enclosure for protecting media comprising the steps of:

molding an integral body of resin material in the form of inner and outer shells separated by a space;

filling said space with a water-bearing material;

fabricating an inner repository of a heat-conducting material;

positioning slabs of phase-changing material adjacent to said inner repository;

molding a layer of heat-insulating material around said inner repository and said slabs of phase-changing material; and

inserting said layer of heat-insulating material together with said inner repository and said slabs of phase-changing material into a cavity formed within said inner shell of the integral body of resin material.

31. A method of making a heat and moisture resistant enclosure for storing media comprising the steps of:

molding a first integral body of resin material having inner and outer shells separated by a space;

filling said space of a first integral body with a water-bearing material;

fabricating an inner repository of a heat-conducting material;

positioning slabs of phase-changing material adjacent to said inner repository;

molding a layer of heat-insulating material around said inner repository and said slabs of phase-changing material;

inserting said layer of heat-insulating material together with said inner repository and said slabs of phase-changing material into a cavity formed within said inner shell of the integral body;

molding a second integral body of resin material having inner and outer shells separated by a space;

filling said space of the second integral body with a water-bearing material; and

respectively joining together said first and second integral bodies as a main body and a cover for the enclosure such that said outer shells of said integral bodies form outer skins of the enclosure.

5,069,359

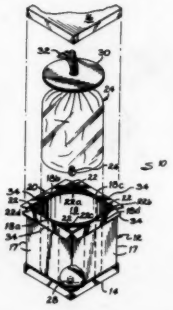
SHIPPING CONTAINER

Henry L. Liebel, 9200 Cunningham Rd., Cincinnati, Ohio 45243

Filed Jun. 5, 1991, Ser. No. 710,659

Int. Cl.[5] B65D *5/50, 5/56*

U.S. Cl. 220—441 **6 Claims**



1. A shipping container adapted particularly for shipping liquids in bulk, comprising:

a four sided outer paper tube having generally rectangular sides of generally equal width;

a generally cylindrical inner tube means within said outer paper tube having a diameter generally equal to the width separating the opposed pairs of sides of said outer paper tube and being adapted to expand towards said opposed pair of sides of said outer paper tube and defining an interior area for receiving material to be contained therein;

triangular-shaped posts disposed in the corners of said outer paper tube between said inner tube means and said sides of said outer paper tube, said inserts being so dimensioned to make tangential contact with said inner tube means for resisting bulging of said inner tube means by the weight of material contained therein;

said inner tube means being adhered to at least one side of said outer paper tube, said outer paper tube and said inner tube means being foldable to a knocked-down position to be stacked and shipped in a substantially flat condition and to be erected for use.

5,069,360

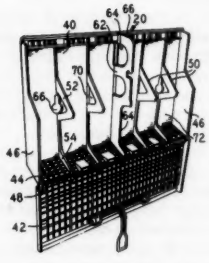
SILVERWARE BASKET WITH CUTAWAY DIVIDER

Geoffrey L. Dingler, and Wilbur W. Jarvis, both of St. Joseph Township, Berrien County, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 27, 1990, Ser. No. 572,434

Int. Cl.[5] B65D *1/24*

U.S. Cl. 220—501 **6 Claims**



1. In a silverware basket for use in a dishwasher, said basket having a rear wall with means thereon for mounting said basket in said dishwasher, a water-pervious front wall spaced from

said rear wall, a water-pervious bottom wall connecting said front and rear walls, and side walls connecting said front, rear and bottom walls, with means for mounting said front wall on said bottom wall to pivot said front wall from a first closed position adjacent said side walls to a second open position downwardly and away from said side walls to provide access to an interior of said basket, the improvement comprising:

a plurality of upper dividers, each upper divider comprising a top leg formed integrally with said rear wall and projecting downwardly toward said front wall, a bottom leg formed integrally with said rear wall and projecting upwardly toward said front wall to join with said top leg,

a plurality of lower dividers, each lower divider being vertically aligned with an upper divider and comprising a trapezoidal projection formed integrally with said rear and bottom walls and projecting forwardly from said rear wall and upwardly from said bottom wall toward said front wall;

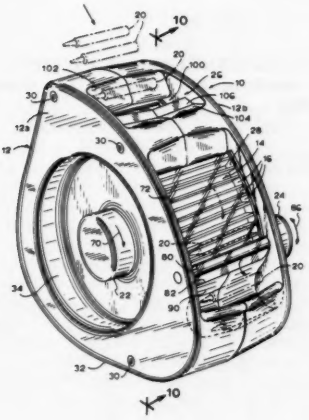
each upper divider and lower divider pair defining a substantially vertical plane bounded by said rear wall, said bottom wall, said front wall and a top of said front wall, wherein a minority of an area of said plane is solid.

5,069,361

CRAYON CADDY

Robert W. Jeffway, Jr., Northampton, Mass., and Catherine R. Dobosz, Monroe, Conn., assignors to Western Publishing Company, Inc., Racine, Wis.

Filed Jul. 26, 1990, Ser. No. 558,010
Int. Cl.[5] G07F *11/00*; B65G *59/00*; A45C *11/34*
U.S. Cl. 221—82 **15 Claims**



1. A caddy comprising:

(A) a stationary frame including a hopper;

(B) a generally cylindrical carrier rotatably disposed in said frame and defining longitudinally-extending compartments on the periphery thereof for the storage of elongate articles therein;

(C) means for rotating said carrier about its longitudinal axis relative to said frame;

(D) means for feeding an elongate article into an empty one of said compartments without disassembly of said caddy; said feed means successively feeding elongate articles from said hopper into said compartments as the rotation of said carrier brings successive empty compartments into operative relationship with said hopper;

(E) means for releasably maintaining the elongate articles fed into said compartments in their respective compartments during rotation of said carrier relative to said frame; and

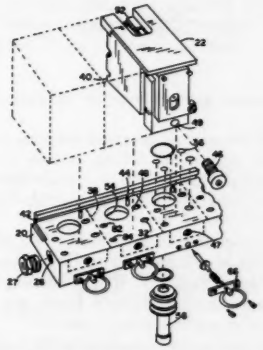
(F) means for discharging from a selected compartment any elongate article therein.

5,069,362

ESCAPEMENT MANIFOLD FOR FASTENER FEEDING MACHINES AND THE LIKE

Clare E. Albright, Grayling, Mich., assignor to Air Way Automation, Inc., Grayling, Mich.

Filed May 2, 1990, Ser. No. 518,020
Int. Cl.[5] B65G *59/00*
U.S. Cl. 221—131 **32 Claims**



1. In a fastener feeding machine of the type having a plurality of fluid-powered escapements, each having an inlet power port associated therewith, and being adapted to select and deliver individual fasteners to a selected workstation in a predetermined sequence and orientation, the improvement of an escapement manifold adapted to support and supply pressurized fluid to each of said escapements, comprising:

a manifold body having a plurality of mounting stations thereon, and a central fluid supply passageway operably communicate with a source of pressurized fluid;

a plurality of manifold ports disposed in said manifold body, and communicating with said central passageway, with at least one of said manifold ports being positioned at each of said mounting stations for selective communication with the power port of an associated escapement;

a plurality of fluid seals positioned about said manifold ports to form leak-resistent seals between said manifold body and each of said escapements; and

means associated with each of said mounting stations for detachably mounting the associated escapement on said manifold body, and being configured such that physical attachment of the associated escapement to said manifold body at a selected one of said mounting stations automatically aligns the power port on said associated escapement with the manifold port at the one mounting station of said manifold body to communicate pressurized fluid therebetween, and simultaneously engages the fluid seal associated with said one mounting station to form a leak resistant seal therebetween.

5,069,363

COMPRESSED GAS CONTAINER

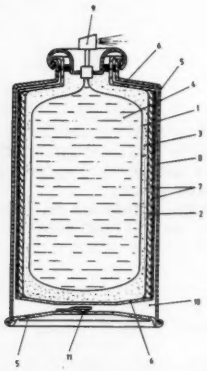
Berthold H. Daimler, Hentzenalleid 13, 5630 Remscheid 11, Fed. Rep. of Germany

Filed Mar. 21, 1990, Ser. No. 496,903

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1989, 3940601

Int. Cl.[5] B65D *83/14*

U.S. Cl. 222—95 **17 Claims**



1. A compressed gas container for dispensing a product comprising:

an essentially pressureless, compressable product receptacle;

an elastically prestressed, hollow cylinder enclosing the product receptacle, said hollow cylinder being formed of elastomeric material and being expandable in one direction only;

a clearance space formed between the product receptacle and the hollow cylinder, said clearance space being hermetically sealed from ambient and containing a gas which, when the product receptacle is empty, has a minimum pressure of approximately P_{min}; and

a product to be dispensed contained in the product receptacle in an amount such that the gas in the clearance space has a maximum pressure of approximately P_{max}, whereby the pressure of the gas varies, as a function of the amount of product contained in the product receptacle, between the minimum pressure P_{min} and the maximum pressure P_{max}.

5,069,364

DISPENSING APPARATUS

Shane R. McGill, c/o Global Ultrafreeze Limited, Unit 9, Ladbroke Park, Millers Road, Warwick, England

PCT No. PCT/GB88/01054, § 371 Date Aug. 10, 1989, § 102(e) Date Aug. 10, 1989, PCT Pub. No. WO89/05096, PCT Pub. Date Jun. 15, 1989

PCT Filed Dec. 7, 1988, Ser. No. 399,536

Claims priority, application United Kingdom, Dec. 10, 1987, 8728904; Oct. 7, 1988, 8823584

Int. Cl.[5] B65D *37/00*

U.S. Cl. 222—95 **10 Claims**

1. Dispensing apparatus for dispensing a frozen product which comprises,

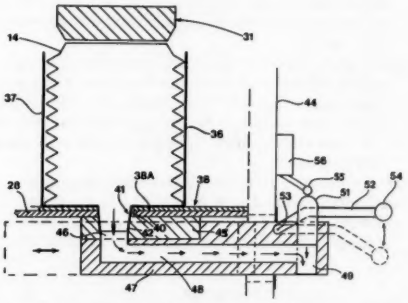
deformable container means of generally cylindrical shape and extending from one end thereof an outlet tube means, the container means being arranged to be removably inserted in the apparatus after prefilling the container means with product to be dispensed;

dispensing means including drive means for engaging the container means at the opposite end to the outlet tube means and deforming the container means to reduce its internal volume and cause product to issue from the outlet tube means in incremental quantities;

shut-off valve means for controlling the discharge of product from the outlet tube means;

outlet duct means communicating with the valve means and sealingly receiving said outlet tube means therein;

a housing defining a generally cylindrical chamber for receiving the container means, the housing defining abutment means engaged by said end of the container means;



refrigeration means whereby the housing, the container means and the product are kept at a low temperature; and

location means for the container means whereby the container means is secured releasably in the housing;

the container means between its ends comprising a deformable side wall whereby the length of the container means is progressively reduced during discharge, and said outlet tube means sealingly engaging with the outlet duct means during operation.

5,069,365

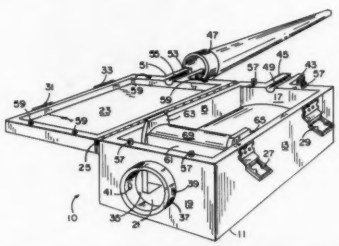
CHEMICAL DISPENSING SYSTEM

Robert C. Woodhouse, 3100 Hathaway, SE., Grand Rapids, Mich. 49506

Filed May 31, 1989, Ser. No. 359,352

Int. Cl.[5] B65D *35/56*

U.S. Cl. 222—105 **5 Claims**



1. A chemical dispensing system comprising:

an enclosure having a bottom, opposed side, front, and rear walls and at least one upstanding pin on each of said front and rear walls and said lid has a mating aperture for each of said pins for tautly and stretchably supporting a bag of chemicals to be dispensed against said lid;

an opening defined in said rear wall for passage of a driving member;

a first part of a nozzle projecting from said front wall; a lid having a top, side, front, and rear walls coupled to said enclosure for movement between a first position closing said enclosure and a second position opening said enclosure;

a second part of a nozzle projecting from the front wall of said lid so that movement of said lid from the second

position to the first position brings said first part of said nozzle into contact with the second part of said nozzle completing said nozzle;

a carriage slidably positioned in said enclosure for movement between said rear and front walls; and

a roller on said carriage for squeezing a packet of chemicals against said lid thereby causing said chemicals to be dispensed through said nozzle when said carriage is moved by the driving member.

5,069,366

ASEPTIC VOLUMETRIC PACKAGING APPARATUS

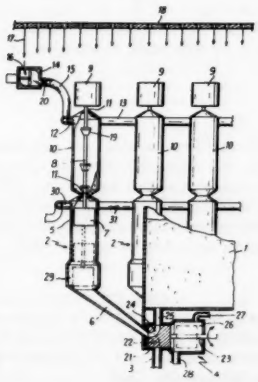
Jean-Jacques Graffin, La Chapelle Du Bois, France, assignor to Ets. A. Bertaud, Vitrolles, France

Filed Feb. 14, 1990, Ser. No. 479,846

Claims priority, application France, Feb. 14, 1989, 89 01880

Int. Cl.[5] B67D *1/08*

U.S. Cl. 222—152 **3 Claims**



1. Packaging apparatus for aseptic volumetric packaging, the apparatus comprising fixed means for forming a flow of sterile air, a feed member, at least one pumping member mounted for moving relative to the flow of sterile air, at least one filler spout and at least one dispenser member attached to the pumping member and the filler spout and disposed so as to alternate between connecting the feed member to the pumping member, and the pumping member to the filler spout, the pumping member comprising a cylinder connected to the dispenser member, a piston mounted to slide inside the cylinder, a drive rod fixed to the piston and connected to an actuator device, and an enclosure fed with sterile air and mounted adjacent to the cylinder, said enclosure surrounding the drive rod of the piston and being fed by a fan member associated with the pumping member to move together therewith and having an intake orifice disposed in the flow of sterile air.

5,069,367

POURING STOPPER WITH TEAR-OFF GUARANTEE STRIP WITH A SEPARATE DIAPHRAGM

Pierre Salmon, Châtillon d'Azergues, and Claude Pradinas, Couzon-au-Mont d'Or, both of France, assignors to Societe Nouvelle de Bouchons Plastiques, Anse, France

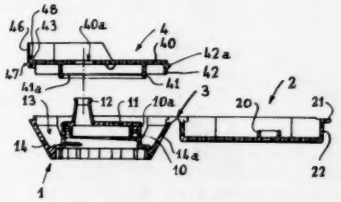
Filed Jul. 9, 1990, Ser. No. 549,936

Claims priority, application France, Jul. 12, 1989, 89 09673

Int. Cl.[5] B67B *5/00*

U.S. Cl. 222—153 **5 Claims**

1. In a pouring stopper for a dispensing container wherein the stopper includes a hollow body and a cap which are jointed by a hinge, the improvement comprising, said body having a central threaded tubular member, a peripheral skirt which extends upward relative to the threaded central tubular member, said skirt having an upper edge, said tubular member being closed by an upper transverse wall from which extends a tubular pouring spout, an annular recess formed between said tubular member and said skirt, a diaphragm separate from the body and mechanically coupled to the body having a generally planar portion hermetically engaging said upper edge of said skirt and covering said annular recess, said planar portion including an opening which hermetically surrounds said pouring spout, said diaphragm having a guarantee band extending vertically from said planar portion and being connected thereto by a zone of lesser resistance, a slot through said band, said cap including an outwardly extending flange, said flange being seated within said slot when said cap is closed relative to said body and said band being separated from said planar portion of said diaphragm at said zone of lesser resistance upon the opening of said cap relative to said body.



5,069,368

DISPENSER BODY, A DISPENSER COMPRISING SUCH A BODY AND THE CORRESPONDING DOME

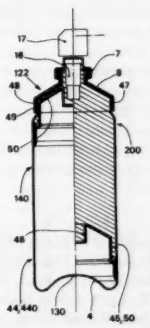
Jacques Godard, Sarreguemines, and Bernard Schneider, Sainte Menehould, both of France, assignors to Cebal, Clichy, France

Filed Mar. 1, 1990, Ser. No. 486,839

Claims priority, application France, Mar. 2, 1989, 89 03414

Int. Cl.[5] B65D *88/54*

U.S. Cl. 222—321 **30 Claims**



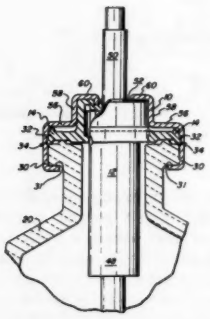
1. A distributor body comprising a housing having a bottom, a lateral wall secured to said bottom and a top end opposite to said bottom, and a dome sealingly fixed to said top end, said dome being rigid and formed of a plastic material and comprising a central annular portion having a minimal thickness of between 1.2 and 4 mm, an upper annular portion and a lower annular portion, said lower annular portion sealingly fixing said dome to said top portion by direct axial fitment, said upper annular portion adapted for receiving distribution means, said upper and lower annular portions extending and framing said central annular portion, and a distribution means comprising a pump or a valve, fixed to said upper annular portion, having outlet means external to said upper annular portion.

5,069,369

METHOD AND ASSEMBLY FOR RETAINING A MOUNTING CUP WITH A SEALING COLLAR

Glenn W. McGarvey, Watertown, Conn., assignor to Risdon Corporation, Naugatuck, Conn.

Filed Feb. 27, 1990, Ser. No. 485,976
Int. Cl.[5] B05B *11/00*; B67D *5/42*
U.S. Cl. 222—321 **11 Claims**



1. An improved mounting cup for use in mounting a sealing collar to a container having a neck with a flange including an upper surface surrounding an opening for dispensing product and an inwardly directed ledge at a lower end thereof, said collar including a resilient deformable molded polymeric material and having a central opening for receiving a dispenser to be mounted in said container through said neck, said mounting cup being formed along an axis and having an end wall extending at least partially normal to said axis for forming a cavity open to at least one end of said cup, said cup being moveable through a path of movement over said container flange to an assembled position with said cavity retaining said sealing collar therein, said mounting cup having a skirt extending from said end wall in an axial direction, said skirt having an inner sidewall facing radially inwardly for engaging a radially outward perimeter of said sealing collar, the improvement comprising:

a circumferentially extending groove formed in said sidewall around at least a portion of said sidewall at a spaced distance from said endwall, said groove for snappingly engaging said collar perimeter when said collar is inserted axially into said cavity, whereby said collar is lockingly retained in combination with said cup by the cooperation of said groove with said collar perimeter to retain said collar with said cup in a pre-assembled state before use in mounting said collar onto said flange.

5,069,370

LARGE SCALE LIQUID MEDIA DISPENSING AND SUPPLEMENTING SYSTEM

David J. Cady, Snyder; Kevin R. Hall, Grand Island, both of N.Y., and Robert W. Lynn, Silver Spring, Md., assignors to Life Technologies, Inc., Gaithersburg, Md.

Continuation-in-part of Ser. No. 541,908, Jun. 22, 1990. This application Aug. 8, 1990, Ser. No. 564,360
Int. Cl.[5] B67D *5/60*
U.S. Cl. 222—464 **11 Claims**

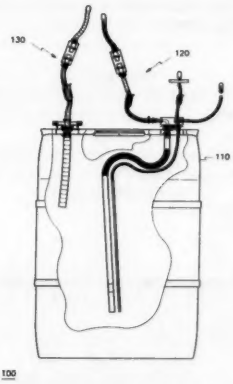
1. An apparatus for dispensing and supplementing a first sterile liquid with a second sterile liquid, the apparatus comprises:

(a) a drum having a first bunge opening and a second bunge opening;

(b) a first member mounted with said first bunge opening and configured to allow the filling of said drum with the first sterile liquid;

(c) a second member mounted with said second bunge opening and configured to allow the filling of said drum with the second sterile liquid and to thereby supplement the first sterile liquid with the second sterile liquid;

(d) said first member being further configured to allow for the dispensing of the first sterile liquid and the second sterile liquid; and



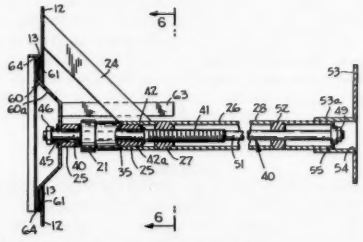
(e) said drum, said first member, and said second member being made of a material compatible with a sterilization process to thereby maintain the sterility of the first sterile liquid and the second sterile liquid should said drum, said first member or said second member come in contact with the first sterile liquid and the second sterile liquid.

5,069,371

BULK MATERIAL CONTAINER WITH A DOOR MOVABLE OVER A RECTILINEAR PATH

Clarence B. Coleman, Oakland, Calif., assignor to Fabricated Metals, Inc., San Leandro, Calif.

Continuation of Ser. No. 322,172, Mar. 13, 1989, Pat. No. 4,923,101, which is a division of Ser. No. 594,840, Mar. 29, 1984, Pat. No. 4,858,791. This application Jan. 25, 1990, Ser. No. 470,321
The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.
Int. Cl.[5] B22D *37/00*
U.S. Cl. 222—509 **1 Claim**



1. A bulk material container comprising:

(a) a bulk material container shell having an exterior wall with an opening formed therein having a plurality of sides;

(b) a door having a plurality of sides and a wall disposed in confronting parallel relation with the wall of said shell, said door being arranged to open and close said opening, said door having fixed thereto a door aligner projecting toward the interior of said container shell;

(c) screw actuating means for imparting movement to said door along a rectilinear path for the opening and closing of said opening and for moving said confronting parallel

wall of said door toward and away from said wall of said shell;

(d) a gasket disposed exteriorly of said shell between said confronting parallel walls of said door and said shell, said gasket being arranged to surround said opening exteriorly of said shell and arranged to be compressed between said confronting parallel walls of said door and said shell to form a seal while said door closes said opening; and

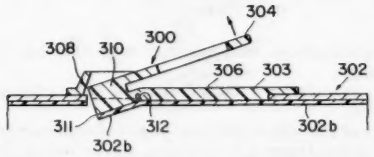
(e) aligner guide means fixedly disposed within said container shell for guiding said door aligner to select the orientation of said door about its centerline to orient its closure alignment with said opening upon closure with said opening.

5,069,372

CARTON EQUIPPED WITH LIQUID POURING-OUT DEVICE

Ryoichi Kawajiri, Kawasaki; Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Division of Ser. No. 247,371, Sep. 21, 1988, Pat. No. 4,948,015. This application Apr. 20, 1990, Ser. No. 512,386
Claims priority, application Japan, Sep. 24, 1987, 62-145729
Int. Cl.[5] B65D *47/10*
U.S. Cl. 222—541 **6 Claims**



1. A carton to be filled with a liquid, comprising:

a liquid impermeable carton container including a wall structure having a mounting aperture provided therein and a gas barrier film disposed on an inner surface of said wall structure and across said mounting aperture;

a liquid pouring-out device fixed to said wall structure and disposed across said mounting aperture, said pouring-out device having a gas barrier layer and being bonded to said barrier film across said mounting aperture such that said barrier film of said wall structure and said barrier layer of said pouring-out device are uninterruptedly continuous when viewed in an outside-to-inside direction with respect to said wall structure, said pouring-out device comprising:

(i) a planar main body having a thin portion forming a traverse hinge in said main body;

(ii) a thick portion integrally formed with an end of said main body and having a breaking edge which is disposed within said mounting aperture and contacts said barrier film; and

(iii) a pull tab member integrally formed with said thick portion;

whereby said breaking edge of said thick portion is pivoted about said hinge into contact with said barrier film when said tab member is pulled, thereby breaking said barrier film such that the liquid is pourable therethrough.

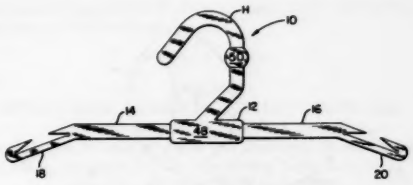
5,069,373

GARMENT HANGER FOR STRAPPED GARMENTS WITH NOTCHING RETENTION

Chester Kolton, Westfield, and Stuart S. Spater, Livingston, both of N.J., assignors to A & E Products Group, a division of Carlisle Plastics, Inc., Woodbridge, N.J.

Filed Sep. 11, 1990, Ser. No. 580,589
Int. Cl.[5] A47G *25/30, 25/48, 25/28, 25/14*
U.S. Cl. 223—85 **15 Claims**

1. An upstanding hanger for the hanging of a garment of the type having shoulder straps, the hanger having a central portion, a hook portion extending upwardly of said central portion and first and second wing portions each having an interior segment extending horizontally outwardly of respective opposed side margins of said central portion, each wing portion having a straight end segment inclined downwardly at an acute



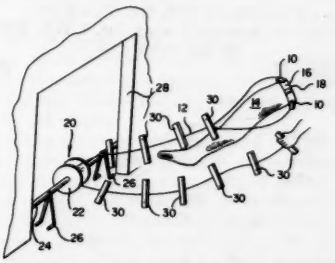
angle with respect to said wing portion interior segment and defining a slot interiorly thereof for receipt of a garment shoulder strap, said end segment having first, second and third courses bounding said slot, said second course being fully disposed at said acute angle.

5,069,374

ELASTICIZED STOCKING REMOVAL SYSTEM

Nina J. Williamson, 218 Shifting Log Dr., Hampton, Va. 23669; Dawn L. Bingham, 580 11th Ave., Cir. NW., Hickory, N.C. 28601, and Mary B. Bauman, 6 Walnut, N. Kingstown, R.I. 02852

Filed Sep. 11, 1990, Ser. No. 580,646
Int. Cl.[5] A47G *25/90, 25/80*
U.S. Cl. 223—111 **7 Claims**



1. A stocking removal system for removing an elasticized stocking from the leg, the stocking having a foot portion and open upper end, the stocking removal system comprising in combination, cord means, attachment means for securing one end of said cord means at the open upper end of the stocking, cord engaging means disposed adjacent the foot portion of the stocking for receiving said cord means so that when the cord means is tensioned around said cord engaging means the upper end of the stocking is drawn downwardly towards the foot portion of the stocking to remove the stocking.

5,069,375

VEHICLE FAST FOOD TRAY

Sandra Flick, 8044 HCR 82/19707 Mtn. Meadow S., Middletown, Calif. 95461

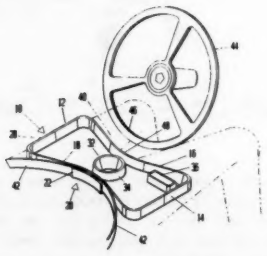
Filed May 22, 1990, Ser. No. 526,891
Int. Cl.[5] B60R *7/00*
U.S. Cl. 224—273 **9 Claims**

1. A food tray adapted to be securely supported on the lap of a person setting in a motor vehicle which includes seat belt restraints that in their restraint positions, extend across the waist of said person, which tray comprises:

a. a generally planar support tray having a generally rectangular exterior shape with a longitudinal axis and a transverse axis and being symmetrical about its transverse axis with forward and rear longitudinal edges and opposite end

edges of lesser length than said forward and rear edges, and with at least one permanent receptacle on its upper surface for retaining a food item;

b. a first inwardly directed and centrally located bow in said rear edge which has sufficient dimensions and is located to



fit in close conformity to the waist of said person, thereby providing substantially equally shaped portions extending symmetrically to either side of said person; and

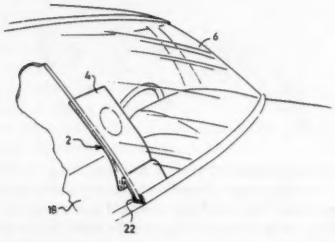
c. a seat belt engaging clip of arcuate shape and symmetrically carried on said centrally located bow in the rear edge of said tray to secure said tray to said seat belt.

5,069,376

MOTOR VEHICLE ACCESSORY PARTICULARLY USEFUL FOR HOLDING A SIGN OR OTHER ARTICLE

Meir Barel, 24 Hare'ut Street, Hod Hasharon, Israel

Filed Dec. 11, 1990, Ser. No. 625,338
Claims priority, application Israel, Jan. 5, 1990, 92976
Int. Cl.[5] B60R *7/04*
U.S. Cl. 224—277 **19 Claims**



1. A motor vehicle accessory particularly useful for holding a sign or other article, comprising: a plate member formed at one end with a mounting section for insertion between the vehicle windshield and the vehicle dashboard; said mounting section including parallel opposed faces extending at an oblique angle to said plate member, and being joined to it by an elastic juncture section, such that when the mounting section is inserted between the vehicle windshield and the vehicle dashboard, the plate member is pressed, by said oblique angle of the mounting section and the elasticity of said juncture section, towards the inner surface of the windshield to thereby contact and releasably press a sign or other article against the inner surface of the windshield.

5,069,377

ROOF RACK FOR VEHICLES

Alton Baughman, 4710 Burtch Rd., North Street, Mich. 48049

Filed Dec. 10, 1990, Ser. No. 625,084
Int. Cl.[5] B60R *9/00*
U.S. Cl. 224—326 **15 Claims**

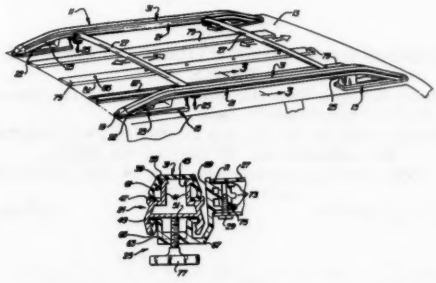
1. Roof rack comprising a pair of parallel spaced interconnected side rails overlying a vehicle roof and at their ends secured thereto;

an elongated cap of an inverted U shape constructed of a flexible plastic material overlying and enclosing a portion of each side rail along its length and interlocked therewith;

said side rail being an elongated extrusion including a pair of parallel spaced top beads along its length;

parallel spaced upright strips depending from said beads, defining a pair of continuous undercut shoulders;

out-turned continuous flanges extending from said strips, respectively;



upright continuous marginal ledges at the outer ends of said flanges;

said cap including a top wall spanning and overlying said beads;

a pair of side walls terminating in a pair of opposed in-turned supports respectively overlying said out-turned flanges and retainingly interposed between each upright strip and adjacent marginal ledge; and

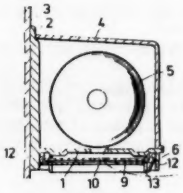
a pair of opposed internal longitudinal anchor flanges upon said side walls, yieldably and interlockingly engaging said shoulders respectively, for securing said cap along the length of said rail.

5,069,378

PAPER DISPENSER

Manfred Baumann, Diepoldsau, Switzerland, assignor to Metsä-Serla Oy, Helsinki, Finland

Filed Mar. 15, 1989, Ser. No. 358,781
Continuation-in-part of PCT/SE88/00372 Jul. 8, 1988
Claims priority, application Sweden, Jul. 15, 1987, 8702872
Int. Cl.[5] A47K *10/36;* **B65D** *85/674*
U.S. Cl. 225—1 **21 Claims**



1. A method of dispensing a paper web from a dispenser and cutting the paper web into desired pieces comprising the steps of:

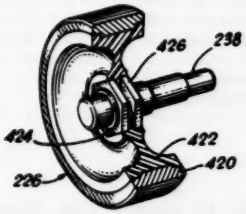
withdrawing a paper web from a dispenser and contemporaneously engaging said paper web in contact with an actuating means for a web cutting means;

moving said actuating means by said contact to thereby move said web cutting means from a passive position, out of contact with said paper web, into an operative position, in contact with said paper web, for cutting a desired piece;

cutting off a desired piece from said paper web; and

withdrawing said paper web by passing said paper web through a web constricting aperture to thereby compact said paper web transversely.

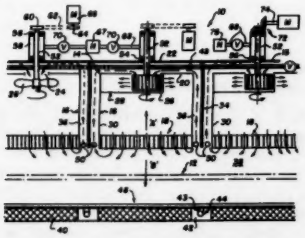
5,069,379
FASTENER DRIVING TOOL
James E. Kerrigan, Des Plaines, Ill., assignor to Duo-Fast Corporation, Franklin Park, Ill.
Division of Ser. No. 476,321, Mar. 17, 1983, Pat. No. 4,928,860.
This application Dec. 8, 1989, Ser. No. 448,063
Int. Cl.[5] B25C *1/06*
U.S. Cl. 227—131 21 Claims



1. In an electric impact tool of the type including a movable impact element adapted to be driven by engagement with a rotating flywheel, the improvement comprising:

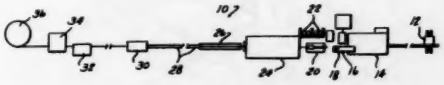
a flywheel having a rigid rim and a resilient hub supporting said rim.

5,069,380
INERTED IR SOLDERING SYSTEM
Carlos Deambrosio, 1 Place de Guise, Apt. 12, Candiac, Canada
Filed Jun. 13, 1990, Ser. No. 537,424
Int. Cl.[5] B23K *3/00, 1/008*
U.S. Cl. 228—42 10 Claims



1. A machine for reflow soldering components on printed circuit boards comprising a conveyor for the printed circuit boards, a housing through which the conveyor passes, sealing means being provided at entry and exit ends of the conveyor with respect to the housing, means for introducing an inert gas into the housing, apertured heating panels disposed in the housing above the conveyor, fan means located in the housing for forcing inert gas through the apertured heating panels onto the conveyor, the fan means having a fan shaft protruding through a wall of the housing for connection to a drive means, and a gas seal provided at the location where the fan shaft protrudes through the wall of the housing to prevent ingress of ambient air into the housing.

5,069,381
NON-CORROSIVE DOUBLE-WALLED TUBE AND PROCES FOR MAKING THE SAME
Glen A. Gibbs, Warren, and Arnold T. Johnson, Davisburg, both of Mich., assignors to ITT Corporation, New York, N.Y.
Filed May 18, 1990, Ser. No. 525,787
Int. Cl.[5] B23K *31/00, 101/06*
U.S. Cl. 228—132 32 Claims



20. A process for producing a non-corrosive, seamless double-walled tubing comprising the steps of:

layering a selected metal on the surface of a sheet of non-ferritic metal, such that the selected metal overlays and is attached to said surface of the non-ferritic metal, the selected metal capable of forming a metallurgical bond with said surface of the non-ferritic metal under subsequent controlled conditions;

milling said metal sheet to sequentially form an unbrazed, unsealed continuous double-walled tube;

removing volatile portions of lubricating material employed during said milling steps from said surface of said continuous tube, said volatile portions consisting essentially of solvents and carriers;

rapidly raising the surface temperature of said continuous tube to an elevated temperature sufficient to trigger fusion between said non-ferritic steel and said selected metal layered there on, said temperature elevation occurring in a humidified gaseous atmosphere, said humidified gaseous atmosphere consisting essentially of at least one inert carrier gas and sufficient hydrogen to achieve and maintain fluxing;

maintaining said unsealed continuous tube in contact with said humidified gaseous atmosphere at said elevated temperature for an interval sufficient to permit fusion between said selected metal and said non-ferritic steel, forming a fused leak-proof, double-walled continuous metal tube;

after fusion between said selected metal and said non-ferritic metal has occurred, maintaining said resulting fused double-walled metal tube in said humidified gaseous atmosphere and allowing said fused continuous metal tube to cool to temperature in a first lowered temperature range, said first lowered temperature range being lower than said fusion temperature and higher than the temperature at which an initial metallurgical transformation of the non-ferritic steel from an austenitic phase to an intermediate phase occurs;

then, rapidly cooling said fused continuous metal tube to a temperature in a second lowered temperature range, said second lowered temperature range being lower than the temperature at which metallurgical transformation of said fused metal from said intermediate phase occurs; and

after reaching said temperature in said second lowered temperature range, slowly cooling said fused continuous metal tube in a non-oxidative atmosphere to a third lowered temperature below which the selected metal fused on said continuous metal tube is not reactive with oxygen.

5,069,382

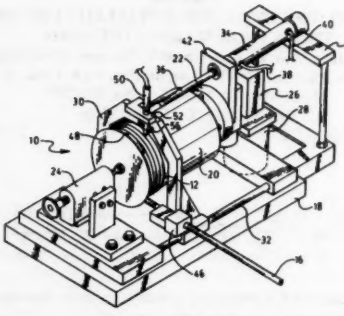
APPARATUS AND METHOD FOR PRODUCING A PRESSURE VESSEL FROM METAL TUBING

Richard J. Misiak, Lakeside, and Kenneth J. Miller, Valley Center, both of Calif., assignors to Solar Turbines Incorporated, San Diego, Calif.

Filed Nov. 16, 1990, Ser. No. 614,801

Int. Cl.[5] B23K *37/02*

U.S. Cl. 228—146 **8 Claims**



1. An apparatus for producing a fabricated pressure vessel from a length of metal tubing, said metal tubing being coiled and welded into a continuous cylindrical wall of the pressure vessel, said apparatus comprising:

a machine frame;

a plurality of ways mounted on said machine frame;

a cylindrical mandrel rotatively mounted on the machine frame;

attachment means for attaching an end portion of the metal tubing to the mandrel;

a carriage connected to said ways and encompassing the mandrel, said carriage being movable along said ways and adapted to guide the metal tube to form continuous adjacent coils around the mandrel;

a tension device mounted on the carriage and engageable with the metal tube, said tension device maintaining a tension on the metal tube and urging the tube into contact with the mandrel during forming of the coil about the mandrel; and

welding means for simultaneously joining adjacent coils of the metal tubing together at an apex between the abutting coils of said tubing during winding of said coils on said mandrel, said welding means being connected to and movable with said carriage.

5,069,383

DIFFUSION BONDING AND SUPERPLASTIC FORMING

Graham A. Cooper, and Ian E. Bottomley, both of Preston, United Kingdom, assignors to British Aerospace PLC, London, United Kingdom

Continuation of Ser. No. 527,958, May 24, 1990, abandoned, which is a continuation-in-part of Ser. No. 373,492, Jun. 30, 1989, Pat. No. 4,948,457. This application Apr. 30, 1991, Ser. No. 693,036

Claims priority, application United Kingdom, May 25, 1989, 8912025

Int. Cl.[5] B23K *20/00*

U.S. Cl. 228—157 **10 Claims**

1. A method of forming a structure having an internal cavity, which method comprises

(a) arranging a plurality of sheets of a superplastic metal in a stack,

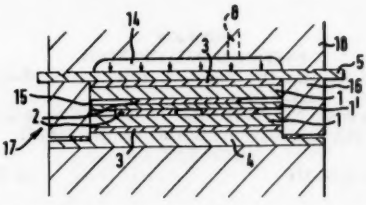
(b) interposing a self-supporting lamella of predetermined shape of inert porous material between adjacent sheets to prevent bonding between said adjacent sheets in selected regions thereof covered by the lamella, while permitting bonding to occur in other regions not covered by the lamella,

(c) subjecting the stack of sheets to diffusion bonding to bond the sheets together in the said other regions,

(d) subjecting the thus bonded stack to superplastic forming to form the said structure by

(i) placing the stack in a mould,

(ii) heating the stack to a temperature at which the metal becomes superplastic and



(iii) injecting a gas between the sheets at one or more selected points to inflate the stack to conform to the shape of the mould, thereby also forming the said cavity within the structure, said gas passing from the gas injection point through the porous lamella to reach the said selected regions, and

(e) removing the structure from the mould.

5,069,384

ENVELOPES

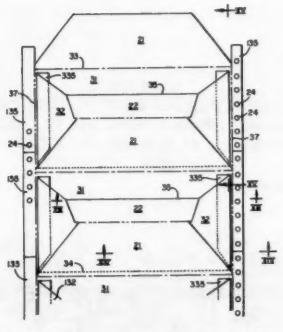
Laurence J. Bell, 110 Rathmines Road, Hawthorn, Victoria 3122, Australia

Continuation-in-part of Ser. No. 67,644, Jun. 26, 1987, Pat. No. 4,896,821, which is a continuation-in-part of Ser. No. 853,547, Apr. 18, 1986, abandoned. This application Nov. 3, 1989, Ser. No. 431,309

Claims priority, application Australia, Apr. 19, 1985, PH00222/85

Int. Cl.[5] A65D *27/10*

U.S. Cl. 229—69 **52 Claims**



1. An article of stationary comprising a continuous length of paper or other material suitable for envelope formation folded to define a plurality of envelopes wherein each envelope, excepting that one at one end of the length, partly overlaps and is attached to a first adjacent envelope and, excepting that one at the other end of the length, is partly overlapped by and is attached to another, second, adjacent envelope, wherein each envelope comprises a face panel and a back panel and wherein at least substantially the whole of the face panel of each envelope is not overlapped by an adjacent envelope wherein aid article of stationery is, at least substantially throughout the whole of its length not more than 3 layers thick of said paper or other material suitable for envelope formation and wherein

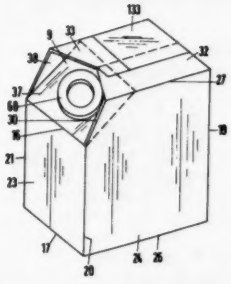
such article of stationery is, at least substantially throughout the whole of the width of each envelope, not more than 3 layers thick of said paper or other material suitable for envelope formation.

5,069,385

CUBOID GABLE PACKAGE WITH A POURING SPOUT ARRANGED IN THE AREA OF A FLAT TOP

Jürgen Färber, Kaarst, Fed. Rep. of Germany, assignor to PKL Verpackungssystems GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Jun. 12, 1990, Ser. No. 536,700
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1989, 3922648; Nov. 24, 1989, 3938916
Int. Cl.[5] B65D *5/08*
U.S. Cl. 229—137 20 Claims



1. A cuboid gable package suitable for holding a liquid or a food, said package comprising

a hollow container formed from a blank of packaging material made from a plastic multi-layer composite deposited on a supporting material,

said container comprising a base, first and second oppositely disposed narrow sidewalls, first and second oppositely disposed broad sidewalls, and a flat top, said container being configured to have a substantially cuboid outer contour,

a web seam which seals said flat top,

said container further comprising a gable pocket adjoining said first narrow sidewall and extending under a first end of said flat top so that said gable pocket lies within the cuboid outer contour of said container,

said blank having a plurality of longitudinal, transverse and oblique groove lines which form edges of said base, said narrow and broad sidewalls, said flat top, and said gable pocket,

said gable pocket comprising an inclined surface formed from a re-entrant fold of said blank and lateral pocket surfaces disposed between said first narrow sidewall and said first and second broad sidewalls, and

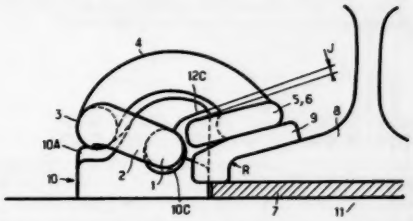
non-integral pouring means disposed on and passing through said inclined surface of said gable pocket for enabling a liquid or food to be poured out of said package.

5,069,386

CLIP FOR FASTENING A RAIL OF A RAILWAY COMPRISING DISPLACEMENT STOPPING MEANS AND SPRING CLIP

Philippe Duval, Lambres-les-Douai, France, assignor to Allevard Industries, Meylan, France

PCT No. PCT/FR88/00495, § 371 Date Apr. 6, 1990, § 102(e) Date Apr. 6, 1990, PCT Pub. No. WO89/03452, PCT Pub. Date Apr. 20, 1989
PCT Filed Oct. 6, 1988, Ser. No. 474,724
Claims priority, application France, Oct. 7, 1987, 87 13860
Int. Cl.[5] E01B *9/40*
U.S. Cl. 238—349 8 Claims



1. A clip for fastening a rail of a railway on a rail support, comprising:

a spring clip forming a means for fastening or clamping the rail on a rail support, constituted by a clip made of elastic metal in the form of an "e" having a first end (A) and a second end (B) and presenting successively, from the first end (A), a first section (1) forming a substantially rectilinear arm parallel to the rail, a second section (2) forming a substantially 180° bend, a third section (3), a fourth section (4) forming a substantially 180° bend disposed on the same side as the second section (2) with respect to the third section (3), and a fifth section (5) disposed substantially parallel to the rail and adapted to exert a clamping effort on the base flange of the rail, and

an anchoring device (10 or 16) comprising a longitudinal orifice (10c) in which is introduced by translation the first section (1) of the spring clip, and an upper surface on which the third section of the spring clip rests when fitted in a clamping position, said anchoring device being also embedded or fixed in the rail support, characterized in that the spring clip further comprises a sixth section (6) disposed transversely with respect to the fifth section (5), being directed towards the first section (1), and the anchoring device further comprises displacement stopping means (12, 13 or 15) for the introduction of the sixth section (6) therein, so that, when the spring clip is mounted on the anchoring device, the spring clip clamps the base flange of the rail by the fifth section (5), and cooperates with the displacement stopping means (12, 13 or 15) for stopping vertical displacement of the fifth section (5), resulting from a rail lifting movement.

5,069,387

CIBERNETIC FOUNTAIN APPARATUS AND VALVE THEREFOR

Emilio C. Alba, Madrid, Spain, assignor to Gibbs & Hill Espanola, Madrid, Spain

Continuation-in-part of Ser. No. 137,405, Dec. 22, 1987, Pat. No. 4,844,341. This application Nov. 21, 1988, Ser. No. 274,119
Claims priority, application Spain, Nov. 23, 1987, 8703327
The portion of the term of this patent subsequent to Jul. 4, 2006, has been disclaimed.
Int. Cl.[5] B05B *17/08;* F21P *7/00;* F16K *31/06*
U.S. Cl. 239—18 16 Claims

1. An automatic system for the selective distribution of liquid streams comprising:

a plurality of liquid delivery members, each having a liquid

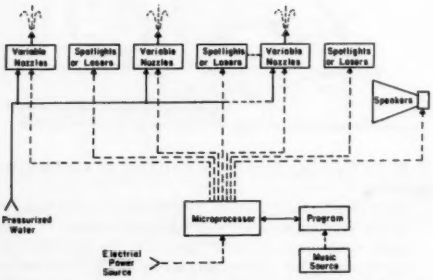
inlet and a liquid outlet and adapted to permit a liquid stream to flow therethrough;

a valve associated with each liquid delivery member for varying the flow of said liquid stream therethrough comprising:

a generally cylindrical body member comprising an inlet cavity, an outlet cavity, and a valve bore therebetween for providing fluid communication between said cavities;

means for selectively controlling liquid flow through said valve bore comprising:

a stopper member moveable along a central axis of said valve between a closed position, whereby said stopper substantially prevents said liquid from passing through said valve bore, and an open position, whereby a predetermined amount of liquid flows through said valve bore;



means for biasing said stopper member toward said closed position; and

means for moving said stopper to said open position to allow said predetermined amount of liquid to flow through said valve bore, said moving means including an electromagnetic controller capable of providing forces for displacing said stopper to any one of a number of positions each of which allow a different amount of liquid flow through said valve bore;

wherein when said valve bore is open, said predetermined amount of liquid flows through said valve bore and exits through said outlet cavity;

wherein the flow of said liquid through the liquid outlet of each of said delivery members is individually controllable by microprocessor means operating each of said valves.

5,069,388

POROUS PIPE LANDSCAPE SYSTEM

Thomas N. Prassas, Glendale, Ariz., and Shannon Bard, Wheeling, Ill., assignors to Aquapore Moisture Systems, Phoenix, Ariz.

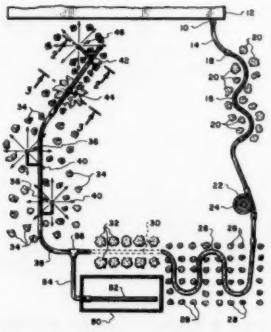
Filed Mar. 12, 1990, Ser. No. 491,818
Int. Cl.[5] A01G *27/00*
U.S. Cl. 239—145 **7 Claims**

1. An irrigation system operable to provide combined point source water distribution and line source water distribution comprising in combination:

water distribution tubing;

point source water emitters adapted to be connected to said tubing;

porous water distribution hose, the porosity of said hose being controlled to pass water therethrough at a rate that is balanced to the rate of water flow through said point source emitters; and



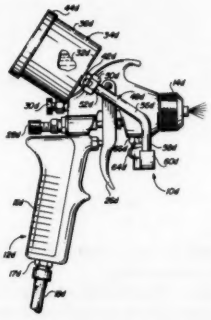
means for connecting said hose and tubing together and to suitable water sources.

5,069,389

ADAPTER FOR AN AIR SPRAY PAINT GUN

Constantine Bitsakos, 26125 Oakflat Ct., Newhall, Calif. 91321

Continuation-in-part of Ser. No. 264,937, Oct. 31, 1988, abandoned. This application Nov. 7, 1989, Ser. No. 432,950
Int. Cl.[5] B05B *7/30*
U.S. Cl. 239—289 **14 Claims**



1. An improved adjustable adapter for an air spray paint gun having an elongated rear handle extending along a first longitudinal axis and an elongated front nozzle portion extending along a second longitudinal axis, wherein said first longitudinal axis and said second longitudinal axis lie in a first plane, said nozzle portion having a paint inlet port on the underside thereof, said adapter comprising:

a) a paint-receiving receptacle having side conconected to a bottom with an outlet in said bottom,

b) an elongated, rigid conduit having,

1) a top portion extending laterally away from said paint gun,

2) a bottom portion extending laterally away from said paint gun, and

3) a mid-portion extending vertically between said top portion and bottom portion, and located to the side of said paint gun,

c) means for connecting the top portion of said conduit to the outlet in the bottom of said container,

d) means for connecting the bottom portion of said conduit to said paint inlet port,

e) whereby said conduit positions the center of gravity of

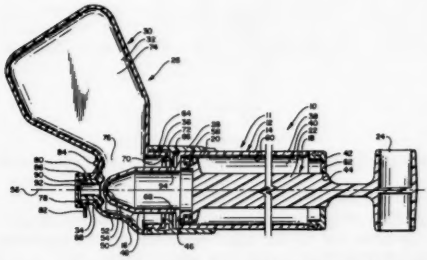
said receptacle above said gun, and substantially within aid first plane.

5,069,390

MANUALLY ADJUSTABLE SPRAY APPLICATOR

Donald J. Stern; Jeff S. Heaton, both of Bellingham; James A. Tryon, Seattle, and Brett A. Bartholmey, Bellingham, all of Wash., assignors to DJ S & T Limited Partnership, Bellingham, Wash.

Continuation of Ser. No. 321,759, Mar. 10, 1989, Pat. No. 4,955,545. This application Jul. 31, 1990, Ser. No. 560,424
The portion of the term of this patent subsequent to Sep. 11, 2007, has been disclaimed.
Int. Cl.[5] B05B 7/24
U.S. Cl. 239—320 19 Claims



1. A spray applicator to discharge a fluid material in a spray pattern by means of pressurized air, said applicator comprising:

a. a fluid discharge section comprising:

i. a mounting structure;

ii. a forwardly positioned fluid nozzle portion providing a fluid discharge nozzle means which is located on a longitudinally extending discharge axis;

iii. said fluid discharge section defining a fluid discharge region located adjacent to and rearwardly of said fluid discharge nozzle means;

iv. a fluid container mounted to said mounting structure and adapted to contain said fluid material, said container having a fluid discharge opening positioned to deliver said fluid material into said discharge region;

b. an air pressurizing and supply section comprising:

i. a housing defining an air chamber;

ii. an air nozzle portion positioned at a forward end of said housing and providing an air discharge nozzle means which is located at said fluid discharge region rearwardly of said fluid discharge nozzle means;

iii. a manually operable pressurizing member mounted in said housing for motion on a pressurizing stroke to provide pressurized air in said air chamber which is discharged through said air nozzle means to cause fluid material in said discharge region to be discharged through said fluid discharge nozzle means, and also for a return stroke;

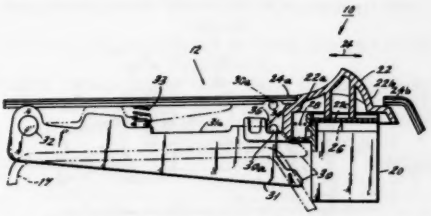
c. said air pressurizing and supply section and said fluid discharge section being connected to one another for forward and rear movement relative to one another in a manner that said air discharge nozzle means moves toward and away from said fluid discharge nozzle means in a manner to control discharge of said fluid material through said fluid discharge opening means, each of said air pressure and supply section and said fluid discharge section being configured to be manually grasped so as to facilitate manually initiated movement toward and away from one another.

5,069,391

DUAL-ACTIVATOR SAFETY SWITCH FOR LIQUID SPRAYER

Craig A. Seasholtz, Avis, Pa., assignor to Shop Vac Corporation, Williamsport, Pa.

Filed Mar. 22, 1990, Ser. No. 497,424
Int. Cl.[5] B65B 11/00
U.S. Cl. 239—332 4 Claims



1. A dual actuator safety switch arrangement for a liquid sprayer, wherein the sprayer comprises a housing having a spray outlet for spraying liquid therethrough, a spray causing switch connectable with a spray generating means for causing the generating means to pump the liquid which sprays from the outlet;

the safety switch comprising;

a manually graspable grip on the housing;

a main switch supported on the housing and movable along the housing for actuating the spray causing switch to causes liquid to spray from the spray outlet when the main switch is in an on position and to stop the liquid spray when the main switch is in an off position; and

a safety actuator having a manually engageable portion normally biased to extend outwardly from the grip; the engageable portion having a main switch blocking off position outwardly of the grip and a main switch disengaging on position toward the grip;

the safety actuator including means for engaging and locking the main switch in the off position for preventing movement of the main switch to the on position when the safety actuator engageable portion is in its off position and for disengaging from and permitting the main switch to be moved to the on position when the safety actuator engageable portion is in the on position

the engaging means on the safety actuator comprises a pin thereon and the main switch includes a recess defined on the main switch for receiving the pin when the safety actuator is in the off position, and the pin the recess prevents movement of the main switch from the off position to the on position and the pin is so placed that movement of the engageable portion to the on position moves the pin out of the recess.

5,069,392

SYNCHRONIZED GRANULAR MATERIAL AND LIQUID SPREADING DEVICE WITH FULL HYDRAULIC CONTROL

James J. Wise, 3020 Mason Ave., Las Vegas, Nev. 89102, and John A. Doherty, 1 Round Hill Rd., Granby, Conn. 06035

Continuation-in-part of Ser. No. 547,950, Jul. 3, 1990. This application Aug. 15, 1990, Ser. No. 568,497
Int. Cl.[5] B05B 12/00
U.S. Cl. 239—675 4 Claims

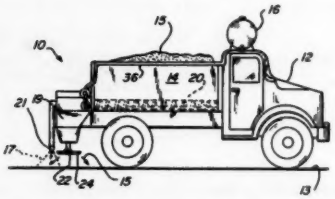
1. A control for a synchronized granular and liquid spreader device mountable on a vehicle comprising in combination:

a granular delivery system mounted on said vehicle for distributing granular material from a hopper, said hopper depositing said granular material onto conveyor means driven by a hydraulic system, said conveyor means for moving the granular material to a pre-selected delivery

position at which delivery position delivery means receive and distribute said granular material;

a liquid delivery system interconnected to said granular delivery system for a synchronous feed rate of the granular and liquid materials, said liquid delivery system for adding the liquid to the granular material generally at the delivery means;

a hydraulic flow control means for directing hydraulic fluid, including means for directing hydraulic fluid to the liquid delivery system or to the granular delivery system; and



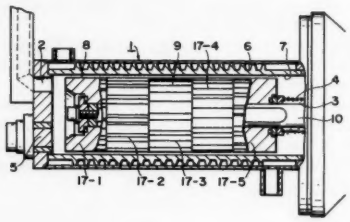
a first hydraulic flow control valve for diverting a selected percentage of hydraulic fluid from the hydraulic system to the liquid delivery system and a second hydraulic flow control valve for supplying a selected percentage of hydraulic fluid to a motor of the liquid delivery system, whereby the first variable flow control valve slows the speed of the conveyor means and lowers the feed rate of the granular material and the second variable control valve sets the feed rate of the liquid.

5,069,393

DISPERSING AND GRINDING APPARATUS

Mitsuo Kamiwano, Yokohama, and Yoshitaka Inoue, Minato, both of Japan, assignors to Inoue Seisakusho (Mfg.) Co., Ltd., Japan

Filed Dec. 5, 1990, Ser. No. 622,426
Claims priority, application Japan, Dec. 5, 1989, 1-314418
Int. Cl.[5] B02C *17/16*
U.S. Cl. 241—46.17 **17 Claims**



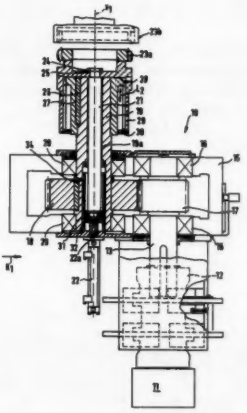
1. A dispersing and grinding apparatus comprising: a vessel for receiving a grinding medium and a material to be processed, the vessel having an inlet for admitting the material into the vessel and an outlet for discharging processed material from the vessel; and a rotor rotatably disposed within the vessel and positioned relative to an inner wall of the vessel to define therebetween a narrow, annular flow path communicating with the inlet and outlet for the passage therethrough of a mixture of the material and the grinding medium; and wherein one of the rotor and the vessel inner wall has a plurality of axially extending processing zones, each processing zone having a plurality of circumferentially spaced-apart and axially extending protrusions separated by axially extending grooves, and the grooves in each processing zone being phase shifted in the circumferential direction with respect to the grooves in adjacent processing zones.

5,069,394

DRIVE UNIT FOR THE REEL-UP OF A PAPER MACHINE OR PAPER FINISHING MACHINE

Väinö Panttila, and Voitto Villgrén, both of Jyväskylä, Finland, assignors to Valmet Oy, Finland

Filed Feb. 13, 1990, Ser. No. 479,361
Claims priority, application Finland, Feb. 16, 1989, 890757
Int. Cl.[5] B65H *18/10*
U.S. Cl. 242—67.1 R **6 Claims**



1. A drive unit for the center-wind reel-up of a paper machine or paper finishing machine comprising:

a motor;

a shaft;

means for connecting said motor and said shaft such that rotational drive of said motor is transferred to said shaft;

a coupling half;

a transfer shaft abutting said coupling half and located so as to abut said shaft and be rotatable with said shaft, said transfer shaft being fitted inside said shaft and displaceable along a longitudinal axis of said shaft such that said coupling half of said drive unit can be coupled and uncoupled with a coupling half of a central drum of a paper web roll;

bearing means located inside said shaft, said bearing means enabling said transfer shaft to rotate while allowing said transfer shaft to be moved along said longitudinal axis during said coupling and uncoupling with said coupling half;

a cylinder drive for displacing said transfer shaft along said longitudinal axis of said shaft;

an outer bushing connected to said transfer shaft through said coupling half, and an inner bushing abutting said shaft, said outer bushing comprising an inner toothing which moves slidably along an outside toothing of said inner bushing when said transfer shaft moves.

5,069,395

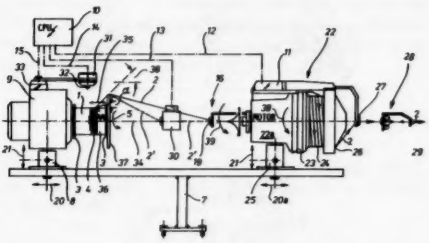
METHOD FOR DELIVERING THREAD TO A THREAD USER AND APPARATUS FOR PERFORMING THE METHOD

Valentin Krumm, Hergensweiler, Fed. Rep. of Germany, assignor to Lindauer Dornier Gesellschaft m.b.H., Fed. Rep. of Germany

Filed May 11, 1990, Ser. No. 522,231
Claims priority, application Fed. Rep. of Germany, May 12, 1989, 3915491
Int. Cl.[5] B65H *51/20, 49/18*
U.S. Cl. 242—47.01 **16 Claims**

1. An apparatus for delivering thread to a thread user, comprising thread supply means including a thread supply spool (1) for providing thread that separates from said thread supply

spool at a take-off point (**44**), spool drive means (**9**) for positively driving said thread supply spool (**1**), sensor means (**32, 48, 49**) for sensing an instantaneous location of said take-off point to provide a control signal representing a motion characteristic of said take-off point, and drive control means (**10**)



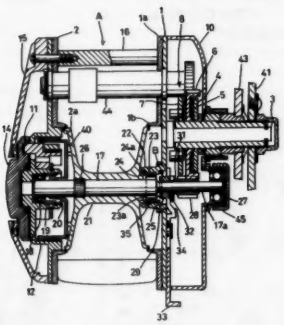
responsive to said sensor means for controlling the operation of said spool drive means so that motions of said take-off point are minimized or reduced to zero in a circumferential direction while still permitting radial and axial movements of said take-off point.

5,069,396

TWO-BEARING REEL

Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Co., Ltd., Sakai, Japan

Filed Apr. 23, 1990, Ser. No. 511,265
Claims priority, application Japan, Apr. 22, 1989, 1-47536[U]
Int. Cl.[5] A01K *89/033*
U.S. Cl. 242—321 **5 Claims**



1. A two-bearing reel comprising:

a first side plate (**1**) and a second side plate (**2**) opposed to each other,

a spool shaft (**17**) carrying a spool (**21**) and rotatably supported between said first and second side plates (**1, 2**), said spool shaft (**17**) including an extension (**17***a*) projecting outwardly from a first bearing (**23**) supported by said first side plate (**1**),

a master gear (**6**) driven by a handle (**41**),

a pinion gear (**28**) meshed with said master gear (**6**) and slidably supported on said extension (**17***a*), and

a clutch (B) provided between said spool shaft (**17**) and said pinion gear (**28**),

wherein said clutch (B) includes engaging projections (**35**) provided on said spool shaft (**17**) and engaging grooves (**30**) provided on said pinion gear (**28**),

wherein said first bearing (**23**) defines passage grooves (**23***a*) on inside surfaces thereof for allowing passage of said engaging projections (**35**) therethrough, said first bearing (**23**) being arranged such that said passage grooves (**23***a*) are perpendicular to a direction in which a load acts on said spool shaft (**17**), and

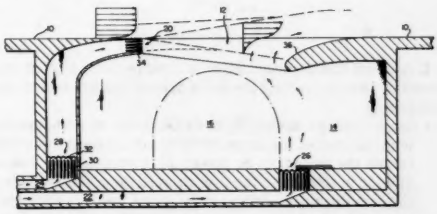
wherein said first bearing (**23**) includes rotation limiting means (**23***b*) on an outer periphery thereof, and said reel further includes a fixing device (**22***a*) which engages said rotation limiting means (**23***b*) to prevent rotation of said first bearing (**23**) and to thereby maintain said passage grooves (**23***a*) perpendicular to the direction in which the load acts on said spool shaft (**17**).

5,069,397

STABILIZED AERO-OPTICAL FREE SHEAR LAYER INTERFACE

Ralph L. Haslund, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1985, Ser. No. 781,864
Int. Cl.[5] B64C *21/04*
U.S. Cl. 244—1 R **40 Claims**



17. A method of establishing an optically steady and clear shear layer of gas over an opening in a vehicle exterior skin operating in a high velocity gas stream, comprising:

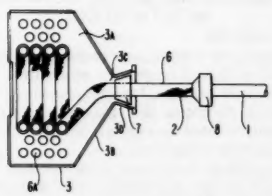
blowing a jet of the same gas as that in said gas stream, at substantially the same total temperature as said freestream total temperature, into said shear layer over said opening.

5,069,398

GUIDE CABLE PROTECTION FOR AIR ROCKETS

Marek Tegel, deceased, late of Schwerte by Anita Tegel, sole heir , and Dieter Wenzel, Haseldorf, both of Fed. Rep. of Germany, assignors to DMT Marinetechnik GmbH, Hamburg, Fed. Rep. of Germany

Filed Dec. 7, 1990, Ser. No. 623,771
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1989, 3940467
Int. Cl.[5] F41G *7/32*
U.S. Cl. 244—3.12 **6 Claims**



1. A protection arrangement for a guide cable of an air rocket started from a launcher and guided into a target by the guide cable, comprising:

a glass fiber cable employed as the guide cable for controlling an air rocket;

a liquid absorbing material covering at least a portion of said glass fiber cable; and

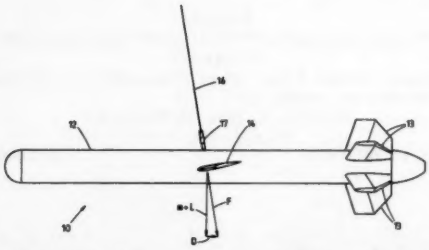
means defining a coil chamber, at least partially filled with a liquid, for storing said glass fiber cable covered with said liquid absorbing material and wound in a coil prior to being unwound upon launching of the air rocket.

5,069,399

TARGET FOR CLOSE IN WEAPON SYSTEMS

Paul R. Robinson, Salisbury, Australia, assignor to The Commonwealth of Australia, Australia

Filed Mar. 15, 1990, Ser. No. 493,903
Claims priority, application Australia, Mar. 16, 1989, PJ3233
Int. Cl.[5] B64D *3/00*
U.S. Cl. 244—14 **7 Claims**



1. A target that is connected by a cable to a tow aircraft and towed by the tow aircraft toward a defense system, said target comprising:

a target fuselage having flight surfaces that in combination with the mass of the target result in a downward force that causes the target to be towed at a substantially lower altitude in relation to the tow aircraft, the cable extending through the upper surface of the target fuselage and being secured to the lower inside surface of the target fuselage;

a cable release means within the target fuselage that upon receiving a control signal operates to disconnect the cable from the target; and

a control means that provides a control signal to the cable release means at a predetermined time to cause release of the cable from the target;

said cable release means comprising a plurality of explosively actuated cutters that are detonated upon receiving said control signal, each said explosive charge by itself being able to sever the connection of the cable to the target, said explosively actuated cutters being positioned along the length of the cable within the target fuselage.

5,069,400

METHOD AND APPARATUS FOR MANIPULATION OF A LOAD FOR CLEANING TOWER STRUCTURE COMPONENTS

Mark P. Kovaletz, 1842 W. Tedmar, Anaheim, Calif. 92804

Division of Ser. No. 177,589, Apr. 4, 1988, Pat. No. 4,973,361.
This application Mar. 20, 1990, Ser. No. 496,250
Int. Cl.[5] B64D *7/00*
U.S. Cl. 244—118.100 **14 Claims**

1. An apparatus for controllably suspending a load having a pair of spaced apart load connection points from a hoverable vehicle, the vehicle having a load attachment point, a releasable hook being connected thereto, and a pair of structural members fixably located on opposite sides of the attachment point, the apparatus comprising:

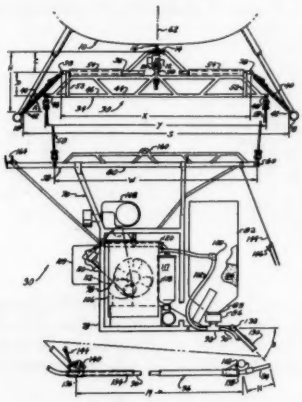
(a) a rigid stabilizer bar having an attachment member for attachment to the attachment point and extending on opposite sides of the attachment point to respective first and second bar attachment points;

(b) a yoke member having a hook attachment member for attachment to the releasable hook, the yoke fixably engaging the stabilizer bar when the hook attachment member is attached to the hook;

(c) a pair of flexible load tension members, each of the load tension members being connected at one end thereof to a respective end of the yoke member;

(d) means for connecting the other end of each load tension member to a respective load attachment point; and

(e) biasing means for yieldably holding the stabilizer bar fixed about a vertical axis and at least one horizontal axis of the vehicle,



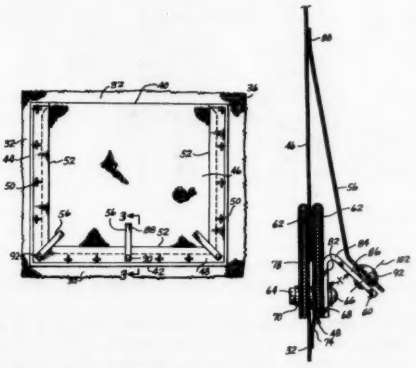
whereby, when the hook is released, the yoke, together with the lines and the load, is jettisoned from the vehicle.

5,069,401

COMPARTMENT PARTITION AND PRESSURE RELIEF DOOR THEREFOR

William R. Shepherd, Seattle, and James H. Huentelman, Kirkland, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 15, 1989, Ser. No. 438,138
Int. Cl.[5] B64D *11/00, 13/00*
U.S. Cl. 244—118.5 **16 Claims**



1. Apparatus for equalizing a pressure differential between first and second bodies, the apparatus comprising:

a. a movable door;

b. means for supporting the movable door, the supporting means (i) being connected between the first and second bodies to maintain the pressure differential therebetween and having an opening which communicates between the first and second bodies, (ii) supporting the door in a manner that the door moves between a first position covering the opening so as to maintain the pressure differential and a second position not covering the opening so as to reduce the pressure differential, the supporting means further including a frame having first and second frame portions which releasably engage the movable door therebetween

in the first position and in a manner that when a selected pressure is reached, the movable door is dislodged from between the first and second frame portions by the force of the pressure differential; and

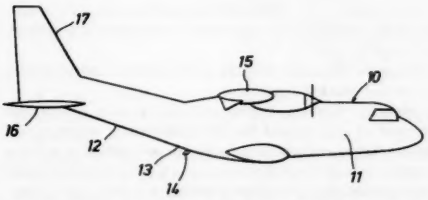
c. attachment and release means, having a first part which is attached to the door and a second part which is attached to the supporting means, for maintaining the door in the first position until reaching the selected pressure differential, and for releasing the door to the second position when the selected pressure differential is reached.

5,069,402

ALLEVIATION OF AIRCRAFT FUSELAGE FORM DRAG

Andrew Wortman, Santa Monica, Calif., assignor to ISTAR, Inc., Santa Monica, Calif.

Filed Apr. 6, 1990, Ser. No. 505,602
Int. Cl.[5] B64 *23/06*
U.S. Cl. 244—130 14 Claims



1. In an aircraft having an upswept tail fuselage, the improvement comprising: a single vortex generator to reduce fuselage form drag positioned on each side of said fuselage near the break in the fuselage adjacent the beginning of the tail upsweep and adjacent the bottom of the fuselage to develop strong transverse outflow from the vertical plane of symmetry that relieves or delays the tendency to flow separation by acting on the external flow field while at the same time energizing the boundary layer to increase its resistance to separation.

5,069,403

DRAG REDUCTION ARTICLE

Francis J. Marentic, Lake Elmo, and Terry L. Morris, St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 740,239, May 31, 1985, Pat. No. 4,986,496. This application May 2, 1990, Ser. No. 517,757
Int. Cl.[5] B64C *21/10*
U.S. Cl. 244—130 10 Claims

1. A method for providing a drag reduction article comprising the steps of

applying a layer of a first radiation curable composition to a carrier,

forming a first patterned surface on said radiation curable composition,

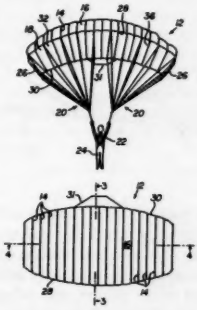
curing said first radiation curable composition by exposure to activating radiation to provide a first cured patterned surface capable of reducing drag resistance when a fluid flow thereacross.

5,069,404

ELLIPTICAL RAM AIR PRESSURIZED AIRFOIL PARACHUTE

John G. Bouchard, P.O. Box 688, North Conway, N.H. 03860

Division of Ser. No. 64,178, Jun. 18, 1987, Pat. No. 4,928,909. This application Oct. 2, 1989, Ser. No. 416,137
The portion of the term of this patent subsequent to May 29, 2007, has been disclaimed.
Int. Cl.[5] B64D *17/02*
U.S. Cl. 244—145 6 Claims



1. A ram air parachute comprising in combination:

an upper surface, having a generally elliptical plan configuration which maximizes an aspect ratio of the parachute;

a lower surface having a generally elliptical plan configuration similar to said upper surface;

a plurality of ribs connecting said upper and lower surfaces together, said ribs having a plurality of openings therein;

a leading edge defining a relatively large opening for admitting ram air into said ram air parachute;

a trailing edge configured so as to minimize the flow of air through said ram air parachute;

a plurality of chambers defined by said upper and lower surfaces, said ribs, said leading edge, and said trailing edge, said plurality of chambers communicating through said plurality of openings in said ribs so as to maintain equal air pressure in all of said chambers;

two stabilizer surfaces depending downward on opposite sides of said ram air parachute, said stabilizer surfaces being attached to said upper and lower surfaces; and

means for controllably attaching said ram air parachute to a parachutists;

wherein the aspect ratio of said ram air parachute is in excess of three thereby resulting in a glide ratio in excess of three.

5,069,405

MOBILE LEAF BAG LOADING FIXTURE

Raymond E. Keating, Overland Park, Kans., assignor to Cornerstone Products, Inc., Overland Park, Kans.

Filed Mar. 19, 1990, Ser. No. 511,212
Int. Cl.[5] B65B *67/00*
U.S. Cl. 248—98 7 Claims

1. A mobile leaf bag loading fixture for use with a flexible bag and adapted for horizontal placement on a support surface to permit direct loading of the bag through its mouth, said fixture comprising:

an elongated back presenting a pair of opposed ends;

a bottom;

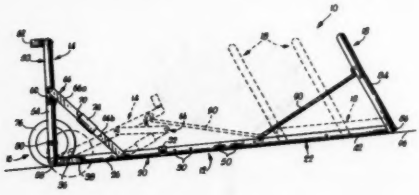
means operably coupling said bottom to said back adjacent one end of the back with the bottom extending forwardly from the back;

an elliptical hoop assembly at the other end of said back for releasably securing a leaf bag therefrom, by stretching the open mouth of the bag over the hoop, the bag extending along said back; means securing said elliptical hoop assem-

bly to said back with the hoop being oriented at an acute angle relative to the longitudinal axis of the back;

a pair of wheels at said one end of the fixture each presenting a radius;

means mounting said wheels in spaced, opposed relationship on said bottom for rotation about respective axes, for permitting said fixture to be moved from a transport position wherein said back is upright, and a loading position wherein said back and said bag are generally horizontal,



the bag and the back being in contact with said support surface throughout the length thereof respectively with said wheels being rendered inoperative; and

the hoop and the mouth of the bag totally defining the other, unobstructed end of the fixture; and when the fixture is horizontal, access to the mouth being unimpeded whereby leaves may be swept in a horizontal path from the support surface directly into the bag through the mouth, to thereby eliminate any lifting of the leaves.

5,069,406

SURF BOARD SUPPORT AND PROTECTOR

Michael Colyer, 307 Madison Ave., Moorestown, N.J. 08057, and Thomas Cucinotta, 702 Buttonwood La., Boynton Beach, Fla. 33436

Filed Jul. 19, 1990, Ser. No. 554,355
Int. Cl.[5] A45F *3/44*
U.S. Cl. 248—156 **6 Claims**

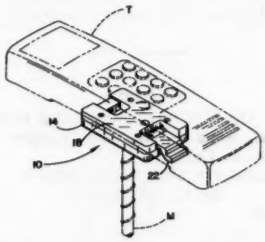
1. A surf board support and protector, said support and protector comprising an internal surface and an external surface, said internal surface defining an internal cavity conforming generally to the shape of the nose portion of a surf board and open at its broadest point for insertion of and receipt therein of the nose portion of a surf board, said external surface of size and configuration to contain said internal cavity and terminating in a wedge configuration in the region of said support and protector in closest proximity to the narrowest portion of said internal cavity, said wedge configuration adapted to be driven into said with the open portion of said cavity above the surface of said sand, said surf board support and protector being constructed of material which is semi-rigid and which is a poor conductor of heat, said internal surface characterized as nonbinding on a surf board when a surfboard is inserted fully into the internal cavity defined by said internal surface.

5,069,407

MOUNTING BRACKET FOR COMMUNICATION RELATED DEVICES

Andy C. Williams, 4251 Lorrain St., Shingle Springs, Calif. 95682

Filed Nov. 2, 1990, Ser. No. 608,282
Int. Cl.[5] A47B *96/06*
U.S. Cl. 248—221.3 **16 Claims**



1. A mounting bracket for use by a user for reversibly installing a cellular phone or related device to a supporting surface, comprising:

a) means for releasably hinging a first bracket component to a second bracket component;

b) means for releasably latching said first bracket component hinged to said second bracket component, wherein said user releases said latching means by application of a finger exerted lifting force directed away from said first bracket component and toward said second bracket component;

c) means for anchoring said first bracket component to said supporting surface; and

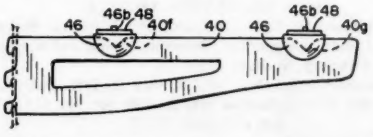
d) means for fastening said second component to said cellular phone or related device.

5,069,408

SHELVING MOUNT SYSTEM

Walter L. Bessinger, Grand Haven, Mich., assignor to Knape & Vogt Manufacturing Company, Grand Rapids, Mich.

Filed Jul. 14, 1989, Ser. No. 381,160
Int. Cl.[5] A47G *29/02*
U.S. Cl. 248—250 **19 Claims**



1. A shelving standard and bracket assembly comprising:

vertical standards to be mounted to a wall in spaced parallel relationship to each other;

said standards each having a front face and a pair of spaced side faces;

said front face having a plurality of vertically spaced slots and intermediate webs for attachment of the lugs of cantilever brackets thereto;

cantilever brackets having lugs extending through said standard slots to anchor on said webs;

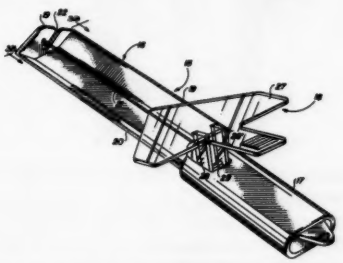
said brackets having recesses in the top thereof;

shelving mounts supported in said bracket recesses, each mount having an upper portion to retain an upwardly facing adhesive surface to engage a shelf placed on said brackets;

a shelf-elevating jack projecting upwardly from said mount and extending above an adhesive surface on said upper portion to temporarily retain a shelf above the adhesive surface;

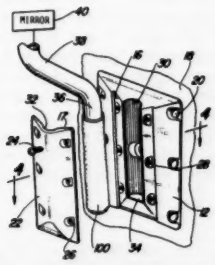
said jack being shiftable downwardly under force to allow a shelf to be lowered onto the adhesive surface.

5,069,409
BOOK HOLDER
Jay D. Batson, 4727 E. Warner Rd., No. 1064, Phoenix, Ariz. 85044
Filed Feb. 19, 1991, Ser. No. 656,878
Int. Cl.[5] A47B *19/00*
U.S. Cl. 248—451 **10 Claims**



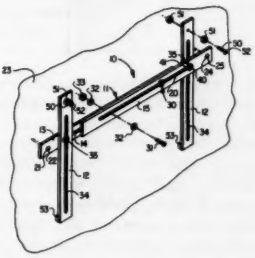
1. A hand held book holder comprising:
an elongated frame for supporting a book in an open book position,
an elongated handle secured to one end of said frame to extend axially therefrom,
a rod extending parallel with and juxtapositioned to said frame to lie over the binding of the associated book when the book is positioned cover down in open book arrangement on said frame,
said rod being detachably secured to one end of said frame and anchored to its other end in said handle, and
a pressure plate rotatively mounted on said handle for lying over one edge of the open pages of the book supported on said frame,
said pressure plate being biased into contact with the pages of the book.

5,069,410
MOUNT FOR A SUPPORT BRACKET
Clyde E. McKee, 22175 Bernard St., Taylor, Mich. 48180
Filed Aug. 3, 1987, Ser. No. 80,821
Int. Cl.[5] B60R *1/00*
U.S. Cl. 248—475.1 **4 Claims**



1. A mounting apparatus for securing to a vehicle a mirror or the like, said apparatus comprising:
a base member having a mounting surface adapted to be secured to a vehicle and an opposite outer surface;
a support bracket having a cylindrical leg mounted to said outer surface of said base member;
a cover member having an inner surface, said outer surface and said inner surface each having portions defining therebetween a cylindrical aperture dimensioned to receive said support bracket leg;
a plurality of ribs spaced along said inner surface so as to form a portion of said cylindrical aperture along with said portion of said inner surface;
means for increasing the frictional resistance between said support bracket leg and said inner and outer surfaces, said means for increasing being disposed between said bracket leg and said portions defining said cylindrical aperture;
wherein said means for increasing friction comprises a resilient member disposed between said bracket leg and said portions defining said cylindrical aperture;
means for securing said cover member to said base member wherein said portions of said inner and outer surfaces and said portions of said ribs frictionally engage said resilient member,
wherein said means for securing said cover member to said base member radially compresses said resilient member between said leg of said support bracket and portion and ribs said portions.

5,069,411
PICTURE HANGER
James P. Murphy, 2817 Stutz Dr., Midland, Tex. 79705-4929
Filed Oct. 10, 1990, Ser. No. 595,291
Int. Cl.[5] A47G *1/24*
U.S. Cl. 248—476 **4 Claims**



1. An adjustable picture hanger comprising;
an adjustable horizontal bar assembly including a first flat horizontal bar member having a single longitudinal slot extending a major portion of the length of said bar member, a second flat horizontal bar member having a single longitudinal slot extending a major portion of the length of said bar member, a plurality of screw assemblies secured in spaced relation through said slots in said first and second horizontal bar members holding said bar members together in juxtapose relation with opposite side edges of said bar members in alignment whereby said bar members are relatively adjustable to adjust the length of said horizontal bar assembly, and each of said bar members having hole means in opposite end portions of said bar members for attachment of said bar assembly to a supporting surface;
a first vertical bar having a longitudinal slot therein; a screw assembly through said slot in said vertical bar and said slot in said first horizontal bar member securing first vertical bar with said first horizontal bar member in adjustable relation;
a picture hanger screw having an enlarged head along an upper end of portion said first vertical bar for attaching a first picture hanger bracket on said upper end portion of said first vertical bar;
a second vertical bar having a longitudinal slot therein;
a screw assembly through said slot in said second vertical bar and said slot in said second horizontal bar member securing said second vertical bar with said second horizontal bar member in adjustable relation and in spaced relation from said first vertical bar;

a picture hanger screw having an enlarged head along an upper end portion of said second vertical bar for attaching a second picture hanger bracket on said upper portion of said second vertical bar; and

a pad across the back face of a lower end portion of each vertical bar sized to position said picture hanger first along a wall.

5,069,412

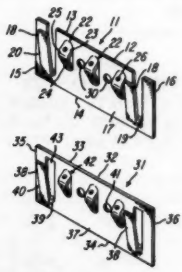
PICTURE HANGER

Richard J. Jacob, Montgomery County, Ohio, assignor to 333 Products, Inc., Kettering, Ohio

Filed May 10, 1991, Ser. No. 698,278

Int. Cl.[5] A47G *1/16*

U.S. Cl. 248—493 **13 Claims**



1. In a picture hanger having integral picture wire support means; the improvement wherein said hanger is formed of a thin flat rectangular sheet of uniform thickness having a substantially uninterrupted planar surface having upper, lower and side edges, said support means being formed from bent out portions of said sheet, said support means formed from segments of said sheet including portions of said upper edge, and extending along a major extent of said sheet in a direction toward said lower edge, said bent out portions extending outwardly at an angle to said planar surface and having spaced wire contact points, whereby said support means provide adjustable positioning of said picture.

5,069,413

CENTRIFUGE MOTOR MOUNT HAVING TWO SLOTTED MEMBERS

David M. Carson, Newtown, and William A. Romanauskas, Southbury, both of Conn., assignors to E. I. du Pont De Nemours and Company, Wilmington, Del.

Division of Ser. No. 179,796, Apr. 11, 1988. This application Nov. 3, 1989, Ser. No. 431,224

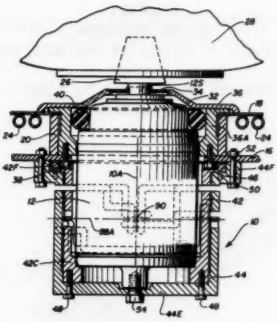
Int. Cl.[5] F16M *13/00*

U.S. Cl. 248—638 **1 Claim**

1. A mounting apparatus having an axis therethrough, the mounting apparatus comprising:

a first and second mounting member, each mounting member being generally cylindrical in shape, the mounting members each being provided with an array of slots which cooperate to form in each member a first plurality of columns the axes of which are parallel to the axis of the mounting member and a second plurality of columns the axes of which extend perpendicular to the axis of the mounting member, the columns in one member that are parallel to the axis intersecting the columns in the other member that extend perpendicular to the axis,

the columns being arranged such that a moment force imposed on the mount is accommodated by bending of at least some of the columns while vertical, lateral and torsional forces imposed on the mounting member are ac-



commodated by compression or tension in at least some of the columns.

5,069,414

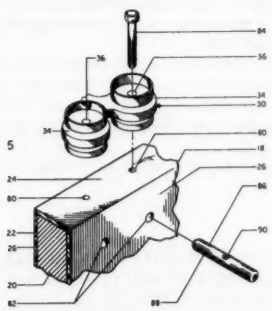
BOAT ENGINE MOUNTING

Scott A. Smith, Holland, Mich., assignor to S2 Yachts Incorporated, Holland, Mich.

Filed May 1, 1990, Ser. No. 517,234

Int. Cl.[5] F16M *1/00*

U.S. Cl. 248—638 **8 Claims**



1. A boat engine mounting in a boat hull having a plurality of stringers, including an engine mount overlying one of the stringers for support thereby, at least one pair of intersecting bores formed in said one stringer and comprising a horizontal bore extending transversely of said stringer from a lateral surface thereof, and a vertical bore extending downwardly into said stringer from an upper surface thereof to intersect the horizontal bore, a nut seated in the horizontal bore and having a threaded bore aligned with the vertical bore, and a fastener carried by the engine mount and having a threaded shaft extending downwardly in the vertical bore and matingly received in the threaded bore to secure the engine mount to said stringer.

5,069,415

ADJUSTABLE MOUNTING ASSEMBLY FOR ELECTRIC MOTORS

Emmanuel Mechalas, 123 N. Hazel, Danville, Ill. 61832

Filed Jul. 25, 1990, Ser. No. 556,998

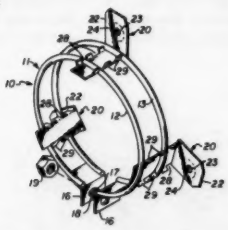
Int. Cl.[5] F16F *15/04*

U.S. Cl. 248—674 **10 Claims**

1. A mounting assembly for mounting electric motors and the like onto a support surface comprising; clamp means including a band for embracing the article to be mounted,

a plurality of independently adjustable mounting brackets each having a leg portion for abutting the surface of the article to be mounted and a base portion disposed at a right angle thereto and having an aperture for mounting the bracket onto the support surface for supporting the article thereon,

each said bracket leg portion having a plurality of longitudinally spaced openings for receiving the band of said clamp means in selective positions along its length, and



each said bracket being removably and adjustably connected with said band for circumferential positioning at selective locations on said band to axially align the apertures of said base portions with an existing mounting arrangement of the support surface, and

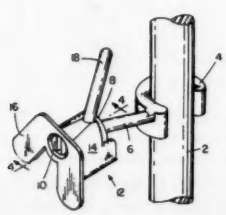
each said bracket being adjustably connected with said band for longitudinal positioning relative to said band and to the article to be mounted for placing the article relative to the support surface whether the support surface is planar or non-planar.

5,069,416

DISPLAY FIXTURE FOR SPECTACLES

Jan S. Ennis, Redmond, Wash., assignor to Ennco Display Systems, Inc., Redmond, Wash.

Filed Dec. 17, 1990, Ser. No. 629,276
Int. Cl.[5] A47F *5/00*
U.S. Cl. 248—902 **4 Claims**



1. A display fixture for spectacles comprising:

a nosepiece having a face and a bore extending substantially perpendicular to its face, said nosepiece including means to retain the spectacles upon the nosepiece, and

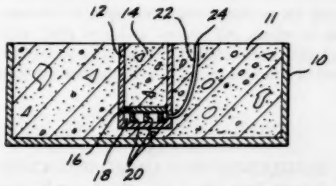
support means for securement to a relative fixed object, said support means, including a bifurcated rod extending outwardly therefrom, said rod mated with the bore in the nosepiece allowing the nosepiece to be pivoted around the rod for selective display orientation.

5,069,417

APPARATUS FOR PRODUCING A CURED-IN-PLACE TEST SAMPLE OF CONCRETE

Richard J. Boss, 19015 36th Avenue West, Suite C, Lynnwood, Wash. 98036

Filed Jul. 13, 1990, Ser. No. 553,440
Int. Cl.[5] G01N *1/04;* B28B *7/12*
U.S. Cl. 249—74 **15 Claims**



1. A mold for producing test samples of concrete comprising:

a closed self-supporting sidewall;

a bottom wall attached to said sidewall;

a movable insert placed within said sidewall above said bottom wall to define a pressurization chamber between said insert and said bottom wall;

a fluid inlet in said mold in fluid communication with said pressurization chamber; and

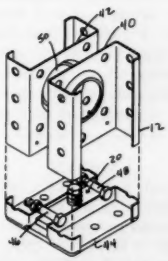
a fluid inlet tube connected at a first end thereof to said fluid inlet and connectable at a second end to a source of pressurization fluid.

5,069,418

DEVICE FOR LEVELING CONCRETE FORM ASSEMBLIES

Albert L. Jennings, Des Moines, Iowa, assignor to Economy Forms Corporation, Des Moines, Iowa

Filed Jan. 5, 1990, Ser. No. 461,354
Int. Cl.[5] E04G *17/14*
U.S. Cl. 249—210 **3 Claims**



1. A device for leveling a longitudinally extended concrete form assembly, said leveling device comprising an upright supporting beam formed by a pair of upright elongated members arranged in spaced relation and connected together at each end by an end plate, at least the lower one of said end plates having a central throughbore, said leveling device further comprising:

(a) a block member located between the upright members in resting engagement on the upper surface of the lower one of the end plates;

(b) said block member having a threaded throughbore in axial alignment with the throughbore of said lower end plate;

(c) a leveling screw in threaded engagement with said block in the bore thereof having a head portion projected above said block member and a foot portion retractable and

extensible relative to the bottom surface of the lower end plate;

(d) said bottom surface of the lower end plate located on a load bearing surface for support of said foot portion of said leveling screw upon extension of said leveling screw from said axially aligned bores;

(e) a space above said head portion of said leveling screw between said upright members being open on at least one side thereof for accommodating the insertion and operation of a tool to rotate said leveling screw; and

(f) means for securing said block member between the upright members and against said end plate whereby on extension or retraction of said leveling screw said beam is raised or lowered to horizontally adjust the form assembly.

5,069,419

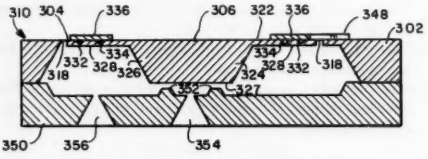
SEMICONDUCTOR MICROACTUATOR

John H. Jerman, Palo Alto, Calif., assignor to IC Sensors Inc., Milpitas, Calif.

Filed Jun. 23, 1989, Ser. No. 370,545

Int. Cl.[5] F16K *7/14, 31/02;* **G01B** *9/02;* **F03G** *7/06*

U.S. Cl. 251—11 **13 Claims**



1. A semiconductor microactuator, comprising:

a semiconductor substrate;

a movable element; and

suspension means coupled to said semiconductor substrate and to said movable element for suspending said movable element from said semiconductor substrate and for constraining displacement of said movable element with respect to said semiconductor substrate solely to irrotational displacements, said suspension means having a first portion having a first thermal coefficient of expansion and a second portion having a second thermal coefficient of expansion different from said first thermal coefficient of expansion for displacing said movable element with respect to said semiconductor substrate when the temperatures of said first portion of said suspension means and said second portion of said suspension means are varied.

5,069,420

PROPORTIONAL PRESSURE CONTROL VALVE

Thomas J. Stobbs, West Allis, and Kishor J. Patel, Mukwonago, both of Wis., assignors to Applied Power Inc., Butler, Wis.

Continuation-in-part of Ser. No. 477,026, Feb. 8, 1990. This application Jun. 7, 1990, Ser. No. 534,386

Int. Cl.[5] F16K *31/40*

U.S. Cl. 251—30.02 **7 Claims**

1. A proportional pressure control valve, comprising:

a body having:

a poppet bore;

an annular seat adjacent to one end of said poppet bore;

an armature bore adjacent to the other end of said poppet bore;

inlet and outlet ports in communication with the poppet bore, said inlet port being upstream of said annular seat and said outlet port being downstream of said annular seat; and

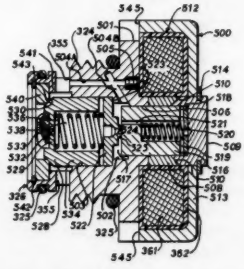
a conduit connecting the armature bore and the outlet port;

an orifice plate separating the poppet and armature bores, the orifice plate having a passage therethrough;

an electromagnetic driver having;

an armature movable within the armature bore between a closed position, where the armature contacts the orifice plate and blocks fluid flow through the passage, and an infinite number of flow positions, where the armature is spaced apart from the orifice plate to permit variable fluid flow through the passage;

an electromagnetic force source associated with the armature, the electromagnetic force source being operable to receive a variable input current and to establish a magnetic flux path through the armature to move the same, the strength of the magnetic flux path being substantially proportional to the variable input current;



a poppet having a main surface and an aperture extending through the main surface, the poppet being positioned within the poppet bore and movable in an infinitely variable manner between a sealing position against said annular seat and an infinite number of open positions, the position of the poppet in the open positions determining in part the magnitude of fluid flow between the inlet and outlet ports;

means for biasing the armature within the armature bore; and

means for biasing the poppet within the poppet bore.

5,069,421

SAFETY DEVICE FOR A PNEUMATIC TOOL

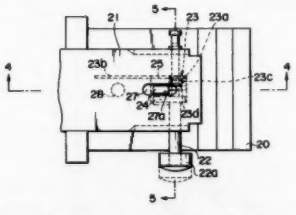
Katsunobu Kishi, and Kinya Nose, both of Tokyo, Japan, assignors to Nitto Kohki Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1990, Ser. No. 569,449

Claims priority, application Japan, Oct. 24, 1989, 1-124158[U]

Int. Cl.[5] F16K *31/60, 35/02*

U.S. Cl. 251—99 **11 Claims**



1. A safety device for a pneumatic tool having a main body and a valve stem upon lowering of which operation of said pneumatic tool begins, comprising:

an operation lever having a flat lower face and movable between an operative position at which said operation lever lowers said valve stem and an inoperative position at which said operation lever is disengaged from said valve stem;

an axially movable pivot shaft for pivoting said operation lever to said main body of said pneumatic tool;

a stop facing said lower face of said operation lever and provided on said pivot shaft such that said stop is moved

by means of said pivot shaft in said axial direction thereof, in response to said axial movement of said pivot shaft, between a rest position at which said stop is engageable with said lower face of said operation lever and an operating position, said stop being arranged to abut against said lower face of said operation lever so as to prevent said operation lever from being moved downward when said stop is at said rest position;

a spring comprising a coiled main portion wound around said pivot shaft and fixed thereto for permanently urging said stop toward said rest position of said stop, and a free end portion extending from said coiled main portion contacting said lower face of said operation lever for urging said operation lever toward said inoperative position of said operation lever; and

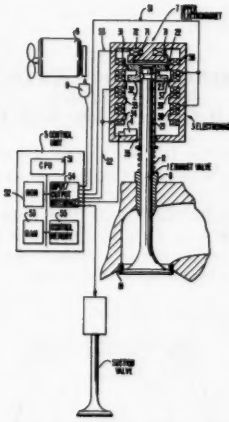
a receiving chamber formed in said lower face of said operation lever at a position at which said receiving chamber receives said stop, upon downward movement of said operation lever, when said stop is moved to said operating position.

5,069,422

ELECTROMAGNETIC FORCE VALVE DRIVING APPARATUS

Hideo Kawamura, Samukawa, Japan, assignor to Isuzu Ceramics Research Institute Co., Ltd., Fujisawa, Japan

Filed Mar. 27, 1990, Ser. No. 500,194
Claims priority, application Japan, Mar. 30, 1989, 1-80131
Int. Cl.[5] F16K *31/06, 31/08*
U.S. Cl. 251—129.1 **10 Claims**



1. An apparatus for driving a suction/exhaust valve of an engine by an electromagnetic force in opening and closing directions, comprising:

at least one movable permanent magnet connected to the suction/exhaust valve and having a pair of magnetic poles arranged with a predetermined spacing in a direction in which the suction/exhaust valve is driven and including an end face of a side of said movable permanent magnet;

a plurality of fixed magnetic poles disposed to oppose the magnetic poles of said movable permanent magnet and arranged with a different spacing there between then the predetermined spacing;

a plurality of fixed excitation coils wound on respective ones of said fixed magnetic poles so that the fixed magnetic poles can be excited;

energizing control means for controlling passage of current through said fixed excitation coils so that an electromagnetic force can act between the magnetic poles of said movable permanent magnet and said fixed magnetic poles, thereby driving the suction/exhaust valve in one of the opening and closing directions; and

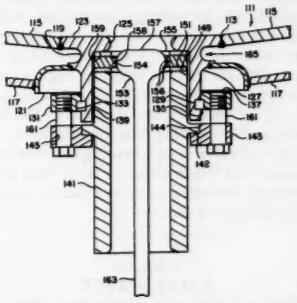
an upper fixed electromagnet disposed to oppose the end face of said movable permanent magnet so that said suction/exhaust valve, can be subjected to a first force acting in the opening direction when an operation for opening said suction/exhaust valve begins.

5,069,423

VALVE FOR CLEAN CHEMICAL REACTOR

Franklyn J. Amorese, Hilton, and Morris E. Gruver, III, Rochester, both of N.Y., assignors to The Pfaudler Companies, Inc., Rochester, N.Y.

Filed Jun. 21, 1990, Ser. No. 541,619
Int. Cl.[5] F16K *51/00;* B65D *90/04*
U.S. Cl. 251—144 **6 Claims**



1. In a vessel, means for emptying said vessel comprising:

a) valve housing means integral with and fixed to said vessel;

b) valve body means removably mounted to said valve housing means;

c) means for sealing said valve body means to said valve housing means, said means for sealing also functioning to inhibit and prevent the accumulation and retention of contamination from materials flowing from said vessel through said valve housing means and said valve body means past and in direct contact with said means for sealing; and

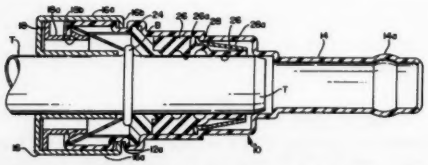
d) valve means, wherein said means for sealing said valve body to said valve housing comprises an upper seal and a lower seal, both of which are flat, circular discs with a seal aperture therethrough, said upper seal which is disposed adjacent to a fluid port and against the face of a port flange which extends from said fluid port to the hollow of said valve housing, said lower seal which is disposed parallel to said upper seal but spaced apart therefrom, against said one end of said valve body which is sealably engaged and wherein said valve seating means comprises a valve seat which is a flat circular disc with a seal aperture therethrough, said seat aperture which is tapered shaped and sized to sealably mate with said valve means, said valve seat which is disposed between said upper seal and said lower seal such that linear force exerted against said valve body in a direction parallel to said predominant central axis of both said valve housing and said valve body will tend to compress said lower seal and said upper seal thus sealing said valve body and said valve seat to said valve housing; and said valve body means functioning to hold, align and contain said valve means.

5,069,424

QUICK CONNECTOR

Robert Dennany, Jr., Lapeer, and Ken Randall, Sterling Heights, both of Mich., assignors to ITT Corporation, New York, N.Y.

Filed Oct. 17, 1990, Ser. No. 599,214
Int. Cl.[5] F16L *37/00*
U.S. Cl. 251—149.6 24 Claims



1. A quick connector for connecting a mating tube to a fluid assembly, said connector comprising, in combination:

a connector housing having a first end for receiving a mating tube and a second end for terminating said housing into a fluid device;

a generally annular seal in asid housing between said first and second ends for sealing engaging said mating tube;

a primary retaining clip in said housing between said first end and said seal, said retaining clip having at least one inwardly directed resilient finger for engaging said mating tube to retain said mating tube in said housing;

a release cap for enclosing said first end of said housing and for receiving said mating tube therethrough; and,

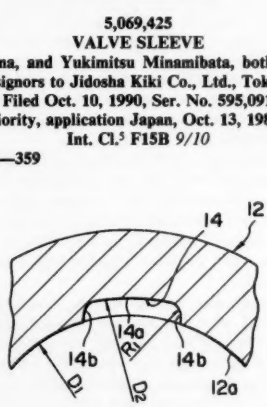
a unidirectional valve in said housing between said seal and said second end which closes to block fluid flow through said housing toward said first end thereof when said mating tube disengages said seal.

5,069,425

VALVE SLEEVE

Takao Kojima, and Yukimitsu Minamibata, both of Saitama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1990, Ser. No. 595,091
Claims priority, application Japan, Oct. 13, 1989, 1-267270
Int. Cl.[5] F15B *9/10*
U.S. Cl. 251—359 4 Claims



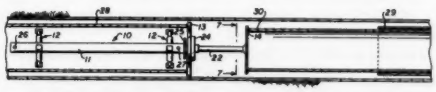
1. A hollow valve sleeve having a plurality of axially extending grooves formed in an internal surface thereof, said axially extending grooves each having a finite depth and includes a bottom wall, upstanding lateral side walls and opposing wall surfaces closing off opposite ends of said axially extending groove, said valve sleeve being adapted to be fitted around a valve rotor to define a rotary valve, wherein a bottom surface of each axially extending groove has a constant depth over a lengthwise extending zone, the bottom surface of each axially extending groove being connected with the wall surfaces located at each opposite lengthwise end of said axially extending groove by arcuate surfaces, the bottom surface being connected with opposing lateral side walls by further arcuate surfaces having a radius which is in the range of one-half to two times the depth of the groove, at least one of the wall surfaces located at one of the lengthwise ends having an angle of inclination which exceeds 60° relative to the bottom surface.

5,069,426

INTERNAL HYDRAULIC PIPE PUSHING APPARATUS

Anthony R. Gabrysch, 509 Suzanne St., Edna, Tex. 77957

Filed Jul. 16, 1990, Ser. No. 552,879
Int. Cl.[5] B23P *19/04*
U.S. Cl. 254—29 R 14 Claims



1. A hydraulic pipe pushing apparatus comprising:

a hydraulic cylinder,

a control valve for selectively activating said hydraulic cylinder,

two sets of three radially-extending, equally-spaced legs adjustably secured on said hydraulic cylinder longitudinally spaced thereon,

means to lock said legs in an extended position during use to center said apparatus inside a pipe,

a lock plate attached to said hydraulic cylinder, and

a piston extending from said hydraulic cylinder,

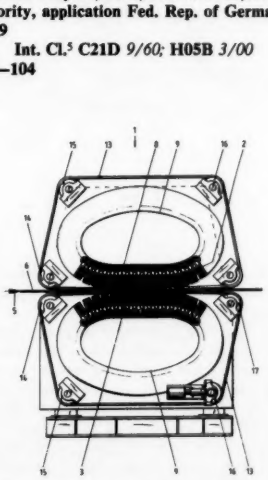
a push plate attached to said piston at the end thereof for pushing pipe through an existing underground pipe when said hydraulic cylinder is activated.

5,069,427

STAND FOR EXERTING A FORWARD OR REARWARD DRAG ON STRIPS

Norbert Umlauf, Haferkamp 64, 5800 Hagen 1, Fed. Rep. of Germany

Filed May 17, 1990, Ser. No. 525,075
Claims priority, application Fed. Rep. of Germany, May 19, 1989, 3916289
Int. Cl.[5] C21D *9/60*; H05B *3/00*
U.S. Cl. 266—104 15 Claims



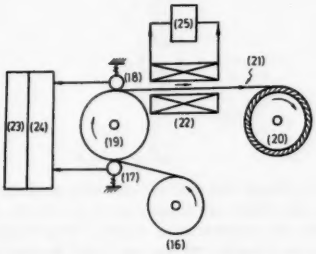
1. A stand for exerting a forward or backward drag upon metal strips or sheets, in particular for a plurality of narrow strips which are to be wound up together with separate braking drags being applied to each strip, between two oppositely disposed, endlessly circulating conveyor chain systems driven by chain wheels, wherein a belt is arranged between at least one of said chain systems and the metal strip.

5,069,428

METHOD AND APPARATUS OF CONTINUOUS DYNAMIC JOULE HEATING TO IMPROVE MAGNETIC PROPERTIES AND TO AVOID ANNEALING EMBRITTLEMENT OF FERRO-MAGNETIC AMORPHOUS ALLOYS

James C. M. Li, 39 Crestriew Dr., Pittsford, N.Y. 14534, and Der-Ray Huang, Taoyuan Hsien, Taiwan, assignors to James C. M. Li, Pittsford, N.Y. and China Steel Corporation, Kaohsiung, Taiwan

Filed Jul. 12, 1989, Ser. No. 379,329
Int. Cl.[5] C21D *9/62*
U.S. Cl. 266—104 7 Claims



1. An apparatus for continuous dynamic Joule heating of ferromagnetic amorphous ribbons, comprising:

means for supplying an AC current or pulsed high current;

a pair of electrode rollers connected to said AC current or pulsed high current supply means;

guiding means in cooperation with said pair of electrode rollers for conveying the amorphous ribbon to move over said electrode rollers and to be heat-treated between said electrode roller; and

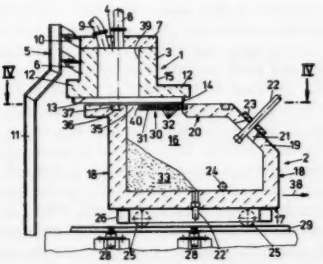
means for applying a magnetic field along a length direction of said amorphous ribbon at a section of said amorphous ribbon extending beyond said pair of electrode rollers.

5,069,429

PLANT FOR TREATING AND MELTING METALS, METAL COMPOUNDS AND/OR METAL ALLOYS OR FOR PRODUCING CALCIUM CARBIDE

Heinrich Auberger, Leonding, and Heinz Müller, Neuhofen, both of Austria, assignors to Voest-Alpine Industrieanlagenbau G.m.b.H., Linz, Austria

Filed Jan. 31, 1991, Ser. No. 648,830
Claims priority, application Austria, Feb. 9, 1990, 287/90
Int. Cl.[5] C21B *7/00*
U.S. Cl. 266—143 16 Claims



1. In a plant for treating and melting a burden comprising one or more materials selected from the group consisting of metals, metal compounds, and alloys, including the production of calcium carbide, said plant comprising a burden-receiving shaft with an opening at its bottom through which burden is discharged, and a melting furnace having a bottom wall, side walls and a ceiling or top portion disposed below and in cooperative association with said shaft, said furnace being provided with a passage opening in said ceiling adapted to receiving burden present in said shaft through said shaft opening, the improvement which comprises:

a gas-permeable supporting plate disposed across said passage opening in said furnace ceiling and supported by said ceiling,

the size of said passage opening corresponding at least to that of said shaft opening and providing a clearance or opening adjacent the supporting plate when said plate is in place,

means separately supporting said shaft as a structural unit above and in cooperation with said melting furnace,

and means cooperatively associated with said melting furnace to effect displacement of said shaft relative to said furnace, including means to allow side-to-side movement of said melting furnace,

said shaft and said melting furnace being relatively movable one with respect to the other away from and to said clearance,

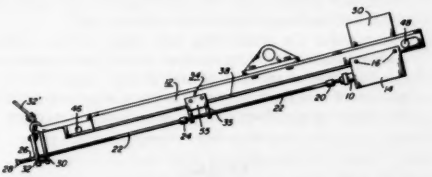
thereby enabling said shaft to be disposed in an operational position above said supporting plate and into a charging position adjacent said supporting plate and above said clearance and back again into said operational position above said supporting plate.

5,069,430

BLAST FURNACE TAP HOLE DRILL WITH CENTRALIZING DRILL ROD SUPPORT

Robert T. Woodings, Pittsburgh, and Ronald J. Mathews, Valencia, both of Pa., assignors to Woodings Industrial Corporation, Mars, Pa.

Filed Oct. 26, 1990, Ser. No. 603,603
Int. Cl.[5] C21C *5/48*
U.S. Cl. 266—271 10 Claims



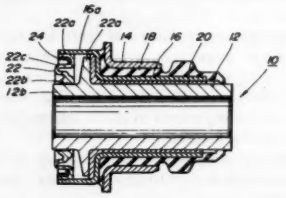
1. A drill assembly comprising an elongated feedshell supporting a percussion drill and an elongated drill rod assembly attached to the percussion drill, whereby said feedshell supports said drill rod assembly at a forward support disposed away from the drill rod, a centralizing drill rod support attached to said feedshell between said forward support and said percussion drill, a drive means for advancing said percussion drill and said centralizing drill rod support along the length of said feedshell as necessary to perform a drilling operation, release means for releasing said centralizing drill rod support from said drive means when said centralizing drill rod support nears said forward drill rod support to stop its forward motion without stopping the forward motion of said percussion drill.

5,069,431

BUSH ASSEMBLY

Toshihiko Kakimoto, and Takuya Murakami, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 259,818, Oct. 19, 1988, abandoned. This application Feb. 15, 1991, Ser. No. 657,267
Claims priority, application Japan, Oct. 19, 1987, 62-261772
Int. Cl.[5] F16F *1/38*
U.S. Cl. 267—141 **6 Claims**



1. A bush assembly used for connecting a first member having an essentially cylindrical opening to a second member, said bush assembly comprising:

an inner cylindrical member defining therein an essentially cylindrical space for supporting an elongated member which engages said second member;

an outer cylindrical member which engages said opening of the first member, said outer cylindrical member being arranged so that the axis thereof substantially coincides with the axis of said inner cylindrical member;

a rigid sleeve arranged between said inner and outer cylindrical members, said rigid sleeve having a greater inner diameter portion at one end thereof so as to form an annular space between said greater inner diameter portion and said inner cylindrical member;

an elastic member, one surface of which is fixed to said outer cylindrical member, and the other surface of which is fixed to said rigid sleeve;

a slipping member arranged between said rigid sleeve and said inner cylindrical member so that said rigid sleeve slidably engages said inner cylindrical member;

a sealing member disposed in said annular space, said sealing member having a fixed portion at one end thereof, in which said sealing member is fixed to one of said rigid sleeve and said inner cylindrical member, a sealing portion at the other end thereof, in which said sealing member contacts the other of said rigid sleeve and said inner cylindrical member, and an intermediate wall portion which defines an annular corrugated diaphragm extending between said greater inner diameter portion and said end portion of said inner cylindrical member; and

a ring member for reinforcing said fixed portion of said sealing member, said ring member essentially extending in the direction of the axis of said greater inner diameter portion of said rigid sleeve, so as to reinforce essentially the whole of said fixed portion of said sealing member.

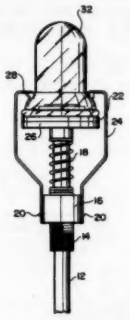
5,069,432

DEVICE FOR HOLDING A GLASS WORKPIECE WHILE SHAPING

William S. Reising, 3 Hardy Rd., Whitehall, Del.

Filed Apr. 5, 1990, Ser. No. 505,172
Int. Cl.[5] B25B *1/00*
U.S. Cl. 269—3 **6 Claims**

1. A device for holding a glass workpiece while finishing comprising an elongate hollow shaft handle at one end of which is affixed clamping means for holding said workpiece, said clamping means comprising an externally threaded sleeve member slideably mounted over said shaft, an internally threaded annular swivel block member threadingly engaged over said sleeve, two arms rotatably affixed at their one end to said swivel block member and having affixed at their other ends a generally U-shaped retaining ring, said shaft at its end having the clamping means being threadingly engaged with a backing flange, said backing flange having a ridged head means attached thereto, the ridges of which accommodate standard glass workpieces, and a spring mechanism located between



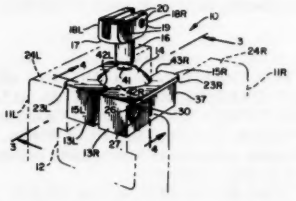
said backing flange and said swivel block member, whereby said clamping means are adjustable longitudinally along the shaft handle, are rotatable about an axis orthogonal to the long axis of the shaft handle and also are rotatable about said shaft handle.

5,069,433

ARTICLE MULTIPLE POSITION SWIVEL BALL MOUNT WITH POSITION HOLD CLAMPING

Robert C. Womack, 5119 Radbrook Pl., Dallas, Tex. 75220

Filed Dec. 19, 1990, Ser. No. 630,008
Int. Cl.[5] B25B *1/24*
U.S. Cl. 269—277 **7 Claims**



1. An infinite position swivel ball mount for articles held thereby comprising: a generally spherical ball with an article mounting extension from the swivel ball; two clampable base members having mirror image recess openings facing each other and together holder said swivel ball; said mirror image recess openings in said two clampable base members having spherical surface areas matching the spherical surface of said swivel ball and opening extension recess means extending beyond the spherical surface of said swivel ball providing clearance in said base members at and around opposite side center areas of said swivel ball for enhanced positive clamping of said spherical surface areas of said base member mirror image recess openings on said spherical swivel ball; wherein said spherical surface areas of said base member recess openings are annular areas around said opening extension recess in each of said base members; said two clampable base members each have outer flat surfaces positioned for engagement by jaws of a vise used to clamp hold the two clampable base members of the infinite position swivel ball mount; and wherein said two clampable base members are held together by a single bolt with the bolt head recessed within a countersunk opening of a first base member and the bolt shank extended through a clearance opening to threaded engagement in an

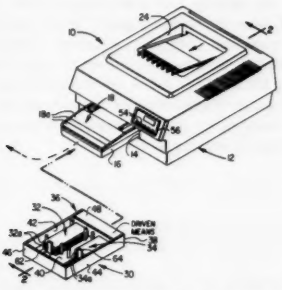
internally threaded opening in the second of said base members.

5,069,434

REMOVABLE DUAL BIN ENVELOPE FEED TRAY FOR AN IMAGE REPRODUCTION MACHINE

Charles A. Sellers, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Jan. 30, 1991, Ser. No. 648,536
Int. Cl.[5] B65H *3/44*
U.S. Cl. 271—2 **23 Claims**



1. A method of feeding envelopes to an image reproduction machine, such as a printer or copier, for imprintation thereby, said image reproduction machine having a housing with an opening therein, a paper supply tray removably insertable into said housing opening and adapted to support a stack of paper sheets, printing means disposed within said housing and operative to imprint paper stock fed thereto, and feed means for feeding paper sheets from the stack thereof supported on the inserted paper supply tray to said printing means, said method comprising the steps of:

removing said paper supply tray from said housing opening;

supporting first and second stacks of envelopes in a side edge-by-side edge, longitudinally parallel orientation;

inserting end portions of the supported first and second envelope stacks inwardly through said housing opening after removal of said paper supply tray therefrom; and

longitudinally feeding envelopes, from a selectively variable one of the first and second inserted stacks thereof, to said printing means.

5,069,435

SHEET STACKER HAVING SHEET-FEED FUNCTION

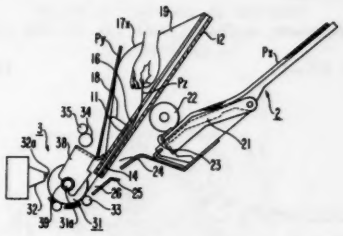
Minoru Mizutani, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

PCT No. PCT/JP90/00049, § 371 Date Sep. 24, 1990, § 102(e) Date Sep. 24, 1990, PCT Pub. No. WO90/08656, PCT Pub. Date Aug. 9, 1990
PCT Filed Jan. 18, 1990, Ser. No. 582,190
Claims priority, application Japan, Jan. 25, 1989, 1-7106
Int. Cl.[5] B65H *3/44*
U.S. Cl. 271—3 **3 Claims**

1. A stacker having a hand-feed function disposed between the printing unit and automatic sheet feeding of a printer to store printed cut sheets, said stacker comprising:

a flat hand-feed chute formed of a front plate, a back plate, and opposite side plates; and

sheet guide members each having an inclined side inclined upwardly with respect to a direction of delivery of printed cut sheets and set upright on an upper surface of said front plate;



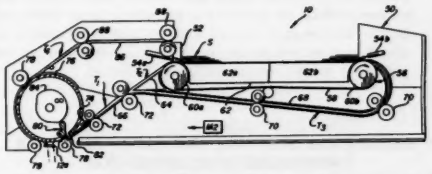
an upper portion of said front plate being cut away to form a hand-feed opening communicating with the interior of said hand-feed chute.

5,069,436

RECIRCULATING DOCUMENT FEEDER

Cor Lubberts, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 6, 1989, Ser. No. 446,832
Int. Cl.[5] B65H *5/22*
U.S. Cl. 271—3.1 **8 Claims**



1. A document feeder for recirculating simplex or duplex original document sheets to and from an exposure station of a reproduction apparatus for enabling selective production of pre-collated or post-collated simplex or duplex copies of simplex or duplex original document sheets, said document feeder comprising:

means for holding a stack of original document sheets;

first transport means for transporting an original document sheet along a first path relative to said exposure station;

second transport means for transporting an original document sheet along a second path in which such sheet is removed from said stack holding means in one direction and delivered in such direction to said first transport means;

third transport means for transporting an original document sheet along a third path in which such sheet is removed from said stack holding means in a direction substantially opposite to said one direction, turned over, and delivered to said first transport means;

fourth transport means for transporting an original document sheet along a path from said first transport means to said stack holding means; and

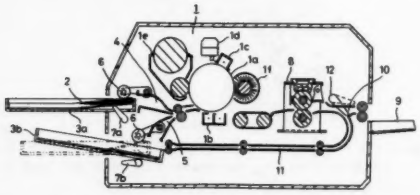
control means for selectively actuating said second or third transport means depending upon whether the original documents in said stack holding means are simplex or duplex.

5,069,437

DUPLEX PRINTING APPARATUS

Yasushi Ishikawa, Tokyo, Japan, assignor to Seikosha Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1989, Ser. No. 458,126
Claims priority, application Japan, Dec. 29, 1988, 63-331209
Int. Cl.[5] B65H *5/22*
U.S. Cl. 271—3.1 **18 Claims**



1. A duplex printing apparatus having a printing means comprising:

first conveyance means for supplying non-printed recording paper from a first paper supply tray to said printing means;

second conveyance means for supplying non-printed recording paper from a second paper supply tray to said printing means;

third conveyance means for conveying the recording paper printed by said printing means to a paper receiving tray;

fourth conveyance means for conveying the recording paper printed by said printing means to said second paper supply tray;

paper switching means disposed at said third conveyance means operable to selectively send the recording paper printed by said printing means to said paper receiving tray or to said fourth conveyance means; and

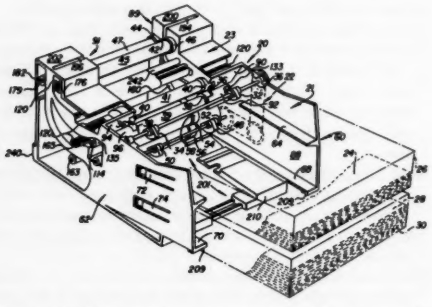
a driving mechanism for said second paper supply tray which is operable to move said second paper supply tray to one position to receive the recording paper from said fourth conveyance means and to another position in which said second paper supply tray supplies said recording paper to said second conveyance means.

5,069,438

PAPER TRAY SUPPORT AND PAPER FEED FOR REPRODUCTION APPARATUS

Carl T. Urban, Troy, and James B. Gahan, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 29, 1990, Ser. No. 604,266
Int. Cl.[5] B65H *5/00*
U.S. Cl. 271—10 **21 Claims**



10. A modular paper cassette support useful ., in reproduction apparatus, comprising:

first and second side panels configured of a resinous material for assembly in opposed relation to define a space therebetween, the assembly having a paper cassette support section and a paper transport section, the paper cassette support section having shelf means unitary with the side panels and extending into the space for supporting at least one paper cassette and the paper transport section having stepped portions unitary with the side panels and extending into the space in juxtaposition with the paper cassette section, each step portion having slot means molded therein for passage of paper sheets removed from the paper cassette and having spindle retainers and shaft bearings unitary therewith and molded therein adjacent the slot means;

an array of rollers paired in opposed relation;

spindles supported by the spindle retainers to extend between the stepped portions of the side panels and shafts journaled in the shaft bearings to extend between the side panels, the spindles and shafts mounting the array of rollers for engaging sheets of paper in the slot means;

a drive mechanism integral with one of the side panels; and

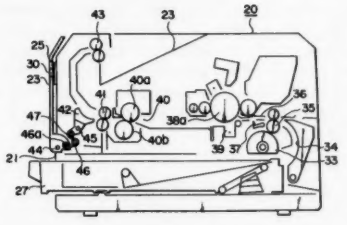
means coupling the drive mechanism to each of the shafts for rotating the shafts to rotate the rollers for one revolution to advance the sheets of paper through the slots and out of the modular paper cassette support for processing by the reproduction apparatus.

5,069,439

IMAGE FORMING APPARATUS WITH IMPROVED OPERATION PANEL OPERABILITY

Satoshi Ise, Machida, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1990, Ser. No. 575,483
Claims priority, application Japan, Sep. 6, 1989, 1-104602[U]
Int. Cl.[5] B65H *11/00, 31/00*
U.S. Cl. 271—163 **14 Claims**



1. An image forming apparatus comprising:

an apparatus body having a casing;

an operation panel section arranged on a side of the casing of the apparatus body;

an opening through which sheets of paper are fed from outside into the apparatus body or discharged from the inside of the apparatus body to outside; and

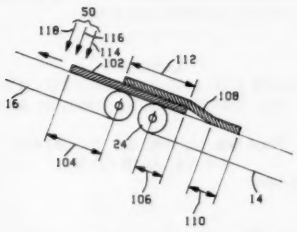
a tray having a front face and a back face and located adjacent to the opening and serving to hold sheets of paper discharged through the opening or guide sheets of paper into the apparatus body through the opening, wherein when the tray is not used, it can be moved to a position where the front face opposes the surface of the operation panel section of the casing, the tray further having an operation section through which the operation panel section of the casing can be operated from the back face when the tray is at that position.

5,069,440

APPARATUS AND METHOD FOR AUTOMATICALLY AND CONTINUOUSLY PRODUCING A FLOW OF SINGULATED MAIL FLATS

S. James Lazzarotti, Broomall; Edward A. Wojtowicz, Bryn Mawr; Eugene T. Mullin, Phoenixville, and Jess Nadel, Downingtown, all of Pa., assignors to Unisys Corporation, Blue Bell, Pa.

Filed Apr. 5, 1990, Ser. No. 504,953
Int. Cl.[5] B65H *29/68, 9/00*
U.S. Cl. 271—202 23 Claims



1. An apparatus for separating and orienting mail pieces, comprising:

a plurality of conveyors arranged in series, each of said conveyors having a belt capable of engaging a surface of a mail piece;

a detector array positioned to detect a mail piece positioned on a conveyor;

a means for driving each of said plurality of conveyors; and

a means for controlling said means for driving to achieve automated separation of overlapping mail pieces on said plurality of conveyors in accordance with information from said detector array, said means for controlling being capable of simultaneously advancing a pair of adjacent conveyors in said plurality, said means for controlling being capable of advancing a succeeding one of said pair of adjacent conveyors while halting a preceding one of said pair of adjacent conveyors at a time when said overlapping mail pieces bridge between said pair of adjacent conveyors.

14. An apparatus for orienting mail pieces, comprising:

a plurality of parallel conveyor belts, each of said conveyor belts being capable of moving in a forward or reverse direction;

a sensor array positioned to detect the orientation of a mail piece on said plurality of parallel conveyor belts;

a means for selectively lifting each of said parallel conveyor belts; and

a means for controlling the movement of each of said belts which uses orientation information from said sensor array to selectively halt or move particular belts of said plurality in either a forward or reverse direction.

5,069,441

BASKETBALL TRAINING ASSEMBLY WITH MULTIPLE HOOPS

Yao-chien Fang, 178, Chung Shui Road, Chunghua, Taiwan

Filed Aug. 2, 1989, Ser. No. 388,522
Int. Cl.[5] A63B *63/08*
U.S. Cl. 273—1.5 A 2 Claims

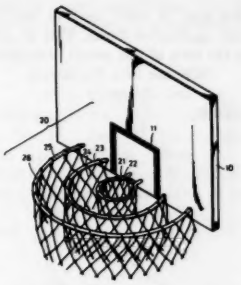
1. A basketball training assembly with multiple hoops comprising:

a backboard, an innermost circular hoop, a middle semi-circular hoop, and an outermost semi-circular hoop;

said hoops being concentric and each of said hoops having a respective net thereof;

said hoops being perpendicularly connected to said backboard on the same plane by connecting means such as screws and nuts on the same plane;

the diameter of said innermost hoop being the smallest, and the diameter of said outermost hoop being the largest;



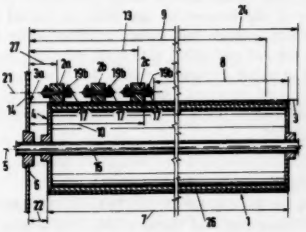
whereby the distance between every two of said hoops is slightly greater than the diameter of a basketball for the basketball passing therethrough.

5,069,442

TRANSPORT DEVICE FOR PAPER SHEETS OF VARYING OR DIFFERENT WIDTHS AND THICKNESS

Martin Storz, Villingen, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Dec. 20, 1990, Ser. No. 630,869
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1989, 3943227
Int. Cl.[5] B65H *9/16*
U.S. Cl. 271—250 22 Claims



1. A device for the transport of paper sheets of varying or different widths and thicknesses, the sheets having a lateral edge (*3a*) and a minimum sheet width, comprising:

an elongated friction roll (**1**) mounted for driven rotation about an axis (**5**) and having a length (**7**), a circumferential periphery and a first end (**4**);

a plurality of pressure rollers (*2a*, *2b*, *2c*) rotatably disposed for spring-urged abutment with the friction roll periphery and with a paper sheet interposed for transport between said pressure rollers and friction roll periphery; and

a guide surface (**6**) for the lateral edge (*3a*) of a paper sheet being transported by the device, said guide surface extending substantially perpendicular to the friction roll axis (**5**) and proximate said first end (**4**) of the friction roll;

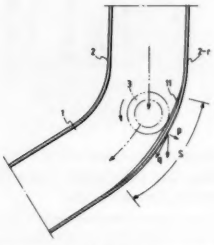
all of said plural pressure rollers (*2a*, *2b*, *2c*) being disposed longitudinally-offset along said friction roller (**1**) on a longitudinal first portion of the friction roller proximate said guide surface (**6**) and including said first end (**4**) so that a second longitudinal portion of the friction roller remote from said guide surface (**6**) and first end (**4**) is free of said pressure rollers, and the pressure roller (*2c*) disposed most remote from said guide surface (**6**) being spaced from said guide surface by a first distance no greater than one-half of the minimum sheet width.

5,069,443

WATER SLIDER LANE

Koji Shiratori, Shizuoka, Japan, assignor to Shiratori Co., Ltd., Japan

Filed Aug. 15, 1990, Ser. No. 567,765
Claims priority, application Japan, May 17, 1990, 2-127103
The portion of the term of this patent subsequent to Jan. 15, 2008, has been disclaimed.
Int. Cl.[5] A63G *3/00*
U.S. Cl. 272—56.5 R **8 Claims**



1. A water slider used with a tobogganing boat having a deformable bottom portion,

said water slider comprising opposing side walls and a connecting slide surface and adapted to permit said boat to travel along said water slider;

a portion of said connecting slide surface being inclined downwardly in a lateral direction from one opposing side wall to the other, whereby said boat is caused to be directed laterally toward said other side wall while travelling along said slide surface;

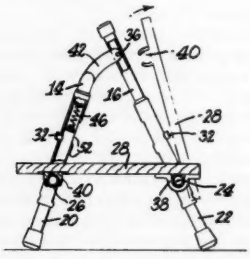
a portion of said slide surface toward which said boat is directed laterally including an upwardly inclined raised portion, said raised portion being configured to permit a portion of the bottom of said boat to extend over and deformably engage said raised portion while being directed toward said other side wall, whereby said boat is caused to rotate circumferentially due to said engagement between said portion of said bottom portion of said boat and said raised portion as said boat travels along said water slider.

5,069,444

DEVICE FOR SIMULATING CLIMBING

William T. Wilkinson, Old Meadow Rd., Rte. 4, Box 205, Seaford, Del. 19973

Filed Oct. 23, 1989, Ser. No. 425,040
Int. Cl.[5] A63B *23/04*
U.S. Cl. 272—70 **8 Claims**



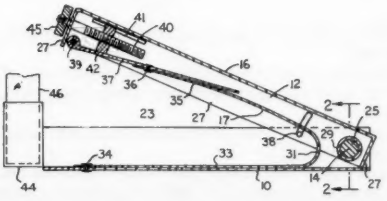
1. A device for simulating climbing comprising a pair of side frames, each of said side frames comprising a pair of upper legs connected together at their upper ends, a lower leg telescoped into each upper leg, a horizontal platform connected to said upper legs, a series of openings in each of said upper legs, each of said openings being arranged in the same plane as a corresponding opening in all of the other of said upper legs to provide a number of sets of openings corresponding to the number of openings in each series, a pin resiliently mounted to each lower leg for selective engagement with a respective opening whereby the height of said platform may be controlled, a pair of cross-pieces, each of said cross-pieces being connected to a respective upper leg in each of said side frames, said platform being mounted to said cross-pieces, said upper legs of each of said side frames being pivotally mounted to each other, and said platform being completely detachably mounted to one of said cross-pieces and pivotally mounted to the other of said cross-pieces whereby said device may be stored in a collapsed condition during periods of nonuse with said platform parallel to and spaced from said other cross-piece.

5,069,445

FOOT AND LEG EXERCISE DEVICE

Phuong N. Mai, 4343 Denham St. #401, Baton Rouge, La. 70805

Filed Sep. 13, 1990, Ser. No. 581,914
Int. Cl.[5] A63B *23/04*
U.S. Cl. 272—96 **2 Claims**



1. A foot-leg exercise device, comprising a base structure; two platforms hingedly connected to said base structure for swinging motions around a horizontal axis, each platform including an upwardly-facing foot-accommodating plate adapted to move between a normal inclined position and a depressed horizontal position; said platforms being laterally spaced apart on the base structure whereby a person can simultaneously have one foot on each platform; a spring means located between each platform and the base structure for biasing the associated platform to its normal inclined position; and a screw-actuated adjustment means for varying the at-rest pressure exerted by each spring means on the associated platform; each said spring means comprising a leaf spring having a curved U-section and two leg sections extending therefrom, one leg section being oriented to exert a downward force on the base structure, the other leg section being oriented to exert an upward force on the associated platform; each said adjustment means comprising a paddle swingably connected to the free end of the associated platform, each said paddle having a free end portion thereof connected to said other leg section of the leaf spring to exert a downward restraining force thereon.

5,069,446

PHYSICAL REHABILITATION DEVICE AND METHOD

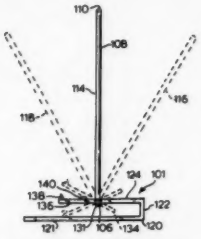
Roger R. Larson, 201 South Fourth St., Wilmington, N.C. 28401

Filed Feb. 20, 1991, Ser. No. 658,057
Int. Cl.[5] A63B *23/04*
U.S. Cl. 272—96 **11 Claims**

1. A rehabilitation device for simulating walking movement, comprising:

a base assembly adapted to repose on a walking surface, comprising a generally planar platform member having a front portion and a rear portion in elevated and generally parallel relationship to said walking surface, having a plurality of slots extending longitudinally through said platform from said rear portion forming a plurality of fingers extending from said front portion of said platform member; and

a foot support member having a generally planar top surface, with anterior and posterior portions for supporting the portions of the foot anterior and posterior of the ball of the foot, respectively, said anterior portion having a plurality of slots extending through said foot support member from said anterior portion of said foot support member forming a plurality of fingers extending from said posterior portion of said foot support member, wherein said foot support member is rotatively mounted on said base such that said rear portion of said platform member is interdigitated with said anterior portion of said foot support member along an axis transverse to said platform member between said



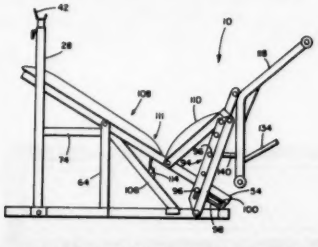
anterior and posterior portions of said foot support member, whereby said foot support member is rotated between a first position characterized by the anterior portion of said foot support member being at a lowest elevation with respect to said platform member, and a second position characterized by said anterior portion of said foot support member being at a highest elevation with respect to said platform member, with the included angle between said anterior member and said foot support member at said first position and the included angle between said anterior member and said foot support platform at said second position each being less than 90 degrees.

5,069,447

ADJUSTABLE WEIGHT-LIFTING BENCH

Fredric Snyderman, Sharon, and Robert H. Russell, Norwood, both of Mass., assignors to CSA, Inc., South Easton, Mass.

Filed Nov. 26, 1990, Ser. No. 618,161
Int. Cl.[5] A63B *21/00*
U.S. Cl. 272—123 **22 Claims**



1. Apparatus for a weight-lifting bench comprising in combination:

(a) frame means including a head-end frame adapted to rest in part on a level surface; a barbell support frame extending upwardly from said head-end frame; a foot-end frame adapted to rest in part on a level surface; a back frame pivotally connected to said head-end frame; a seat frame pivotally connected at a first end thereof to said back frame and pivotally connected at a second end thereof to a first end of a support arm, a second end of said support arm being pivotally connected to said foot-end frame;

(b) fastening means on said support arm and on said back frame to releasably connect said back frame to said support arm adjacent said first end of said support arm or alternatively at at least one other location intermediate said first and second ends of said support arm; and

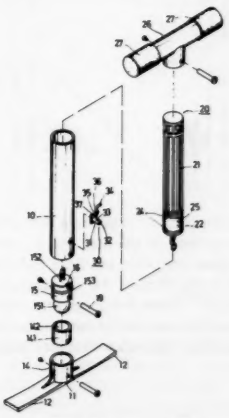
(c) body support means comprising a back support connected to said back frame and a seat support connected to said seat frame.

5,069,448

STOMACH EXERCISE DEVICE

Wen-Bin Shyu, No. 10, Lane 627, Sec. 4, Chung-Ching Rd., Ta-Ya Hsiang, Taichung Hsien, Taiwan

Filed Dec. 6, 1990, Ser. No. 623,320
Claims priority, application Taiwan, Oct. 4, 1990, 79211015
Int. Cl.[5] A63B *21/00*
U.S. Cl. 272—130 **4 Claims**



1. A stomach exercise device comprising:

a base having a dimension sufficient to be positioned beneath two thighs of an exerciser who is sitting; said base including a hollow cylindrical seat and an elongated plate fixed to said hollow cylindrical seat and having two end portions extending in diametrically opposite directions;

a cylindrical housing having a bottom closed end;

a universal joint connected to both said base and said bottom closed end; said universal joint including a ball member attached to said bottom closed end of said cylindrical housing and a cylindrical body fixedly fitted in said hollow cylindrical seat, said cylindrical body having a concavity to receive and engage said ball member;

a piston member disposed in said cylindrical housing and confining a gas chamber with said cylindrical housing;

a piston rod attached to said piston member and having an upper end provided with a handle; and

a valve means attached to said cylindrical housing near said bottom closed end to regulate the air flowing into the cylindrical housing.

5,069,449

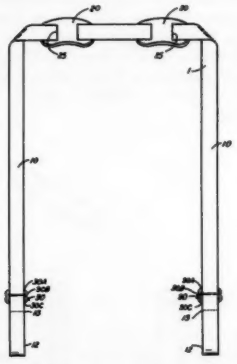
STRAP DEVICE FOR INCREASING LUNG CAPACITY

Mary M. Wardwell, 120 Lakeshore Dr. - T-35, N. Palm Beach, Fla. 33408

Filed Jan. 26, 1990, Ser. No. 470,578
Int. Cl.[5] A63B *21/055*
U.S. Cl. 272—139 **8 Claims**

1. A strap device for increasing lung capacity comprising an elongated strap having two ends, a hand hold means on each end of the strap, said strap being of such a length to extend across a user's back from the end of one shoulder to the end of the other shoulder with one end of said strap extending over said end of one shoulder from the back and under one arm from

the front of the user across the back of the user with one hand hold means extending to the hand of the user on the user's other arm with said other arm being bent at the elbow, and the other end of said strap extending over said other end of the other shoulder from the back and under the other arm from the front of the user across the back of the user with the other hand hold means extending to the other hand of the user on the



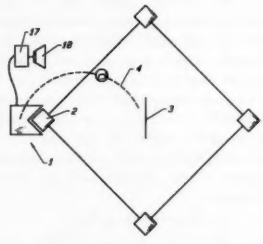
user's one arm with said one arm being bent at the elbow, said strap crossing over itself on the user's back, two shoulder pads are mounted on said strap, one shoulder pad extends from the back of the user to the front of the user and covers the end of one shoulder where it meets the upper arm, the other shoulder pad extends from the back of the user to the front of the user and covers the end of the other shoulder where it meets the upper arm.

5,069,450

AUTOMATIC UMPIRE FOR SLOW PITCH SOFTBALL

Kenneth E. Pyle, 75 Hobson St. #1A, San Jose, Calif. 95110

Filed Jan. 17, 1991, Ser. No. 642,410
Int. Cl.[5] A63B *71/00*
U.S. Cl. 273—25 **12 Claims**



1. An apparatus for use in slow-pitch softball which is played on a conventional softball field having a home plate, said apparatus for detecting and indicating whether a properly slow pitched ball is a strike, comprising:

a flat member, positioned horizontally, adjacent and behind said home plate; said flat member having boundaries defining a slow-pitch baseball strike zone and a surface on which an object may impact; said flat member including means for generating a strike signal whenever a properly pitched ball impacts on its surface; and

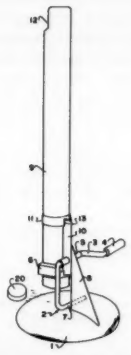
announcement means, coupled to said flat member, for indicating when a strike signal has been generated.

5,069,451

HOCKEY PRACTICE DEVICE

Kent L. Martens, Box 306, and Harvey W. Schulz, Box 356, both of Herbert, Saskatchewan, Canada S0H 2A0

Filed Jun. 18, 1990, Ser. No. 539,138
Int. Cl.[5] A63F *71/02*
U.S. Cl. 273—57.2 **16 Claims**



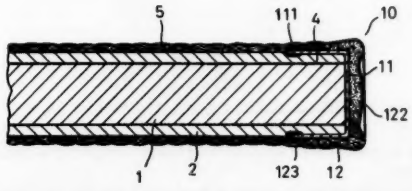
2. Article dispensing means comprising, a base, article storing tube means, support means rigidly supporting said tube means on said base in a vertical position above said base, a discharge lever pivotally mounted on the support means, automatic discharge lever return means attached to said discharge lever, said discharge lever propelling said article by direct contact therewith upon application of a pivoting force thereto, said discharge lever simultaneously retaining a subsequent stored article in the tube until released for gravity feed upon pivoting return of the discharge lever, said support means comprising an upright support fixed to said base, a tube clamp mounting fixed to said upright support and tube clamps connected to said tube clamp mounting, said discharge lever including a foot at one end, an arm at the other end and an intermediate portion pivotally supported in the tube clamp mounting.

5,069,452

RACKET HANDLE BUTT PLATE

Dennis Chen, 293 Pei Tun Road, Taichung, Taiwan

Filed Aug. 29, 1990, Ser. No. 574,592
Int. Cl.[5] A63B *49/00*
U.S. Cl. 273—73 J **1 Claim**



1. A racket handle butt plate for mounting on the rear end of a racket handle comprising:

an elongated octangonal socket body made of rigid plastic material;

said socket body having a single opening on one end for the insertion therein of said racket handle and being covered with a layer of resilient material with a pre-determined thickness gradually reduced from the rear end of said butt plate toward the front end thereof;

said layer of resilient material substantially protruding be-

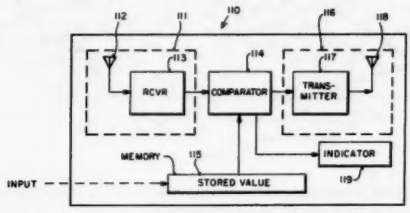
yond the front edge of said socket body and being folded over to adhere the inner surface of the front edge of said socket so as to prevent said layer of resilient material from sliding off said socket body.

5,069,453

TICKET APPARATUS WITH A TRANSMITTER

John R. Koza, Los Altos Hils; John R. Ferguson, Greenbrae, and Maximiano D. Torneros, Fremont, all of Calif., assignors to John R. Koza, Los Altos Hills, Calif.

Continuation-in-part of Ser. No. 461,418, Jan. 5, 1990. This application Jun. 8, 1990, Ser. No. 535,749
Int. Cl.[5] A63F *9/24, 3/06*
U.S. Cl. 273—139 33 Claims



1. A portable electrical ticket apparatus for a game, comprising:

a radio frequency receiver for receiving a broadcast of a dual-tone multifrequency signal containing a winning variable for the game, wherein the broadcast signal is broadcast over a transmission medium;

a dual-tone multifrequency decoder for decoding the broadcast signal received into a multibit decoded signal;

storage means for storing a first variable;

a central processing unit coupled to the decoder and to the storage means for ascertaining whether the first variable stored in the storage means is the winning variable in view of the multibit decoded signal;

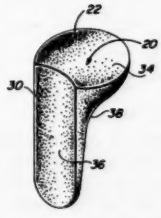
a radio frequency transmitter responsive to the central processing unit for transmitting over the transmission medium a signal that indicates that the first variable is the winning variable if the first variable is the winning variable.

5,069,454

HAND ACCESSORY

John H. Frost, 781 Kohler St., Los Angeles, Calif. 90021

Continuation-in-part of Ser. No. 538,454, Jun. 15, 1990, abandoned. This application Nov. 13, 1990, Ser. No. 611,616
Int. Cl.[5] A63B *57/00*
U.S. Cl. 273—165 12 Claims



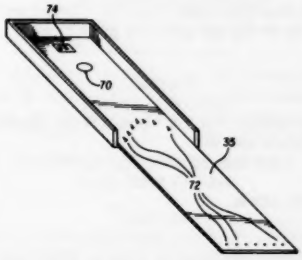
1. A hand accessory to be used in conjunction with the handle of an implement, said accessory comprising a solid plug contoured to extend over, fit into and fill the webbed portion of the hand between the base of the thumb and the base of the forefinger and to extend down into the palm of the hand, said plug being generally inverted L-shaped in side elevation with an upper generally horizontal portion extending over the webbed portion of the hand and having an outer surface which is curved to fit the contour of the handle of the implement when held in the hand, said generally horizontal portion tapering down in thickness from said front to a curved rear, said horizontal front being integral with a vertical portion descending therefrom, said vertical portion having a curved front to fit the contour of said handle and a rear adapted to contact the palm of the hand, said plug being adapted to transmit full power directly between the hand and handle without substantial relative movement of the web between the thumb and forefinger of the hand.

5,069,455

GOLF PUTTING TRAINER

William F. Thomas, 5825 Via Coiba, Riverside, Calif. 92506

Continuation-in-part of Ser. No. 229,700, Aug. 8, 1988, abandoned. This application Oct. 16, 1989, Ser. No. 423,666
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—176 H 6 Claims



1. An adjustable golf practice putting surface comprising:

a sheet of resilient molded material of sufficient size to accommodate use by a human being for practicing putting;

a plurality of elevation adjustment devices;

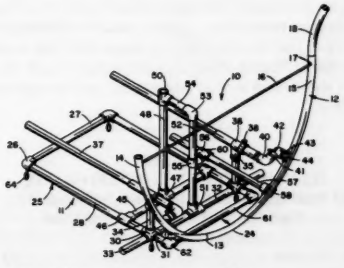
distinct receiving means for receiving said elevation adjustment devices to enable both anchoring of, and free horizontal movement of said elevation adjustment devices along substantially the entire perimeter of said resilient molded material, whereby numerous changes in contour and undulation to said sheet of resilient molded material may be achieved.

5,069,456

GOLF TRAINING APPARATUS

Miro D. Bellagamba, Orlando, Fla., assignor to International Sports Technology, Inc., Orlando, Fla.

Filed Mar. 29, 1991, Ser. No. 677,145
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—183 E 12 Claims



1. A golf training apparatus comprising:

a frame;

a golf club swing guide attached to said frame, said golf club swing guide for guiding a person's swing, said golf club swing guide forming a partially circular pipe member with

two end portions and having a flexible support member connected between said end portions;

said frame including:

a base formed of a plurality of frame members and a pair of outrigger members;

a pair of side swing guide support members, each swing guide support member attached to said swing guide and each swing guide support member being slidably mounted in a supporting sleeve on a side upright frame member attached to said base;

a center swing guide support member attached to said swing guide and being supported in a supporting sleeve on a first center upright frame member attached to said base; and

a second center upright frame member attached to said base and to said first center upright frame member whereby said golf club swing guide is adjusted by sliding said center swing guide support member and said pair of side swing guide support members relative to each other whereby a golf swing training apparatus guides only the golfers backswing and forces the forward swing of the golfer to hit the ball under the guide member.

5,069,457

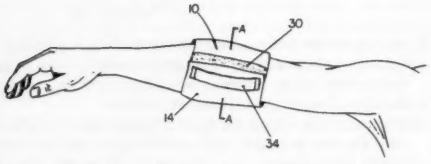
ELBOW SUPPORT

Walter Korzenowski, Box 238, Norman Wells, Northwest Territories, Canada X0E 0V0

Filed Mar. 22, 1988, Ser. No. 171,761

Int. Cl.[5] A63B *69/36*

U.S. Cl. 273—189 R **4 Claims**



1. An instructional aid for use by golfers comprising:

a. an elastic sleeve adapted to surround the elbow region of a golfer;

b. a tensioning strip attached to and depending from said sleeve, the width of said tensioning strip being substantially the same as the longitudinal length of said sleeve, said strip having a first side, a second side and an end remote from said sleeve, said remote end having handle means on said second side;

c. first fastening means disposed on said first side of said strip at said remote end; and

d. second fastening means disposed at regularly spaced points along said second side of said strip whereby said strip may be wrapped around said sleeve, by pulling on said handle means, and maintained in one of at least first and second positions by securing said first fastening means to one of said second fastening means such that in said first position stiffening support is provided to said elbow region and in said second position said elbow region is free to bend.

5,069,458

ILLUMINATING PEG BOARD GAME

Nathaniel Washington, 10022 Kirkwren, Houston, Tex. 77089

Filed Oct. 9, 1990, Ser. No. 594,644

Int. Cl.[5] A63F *3/00*

U.S. Cl. 273—238 **13 Claims**

1. An illuminating peg game board apparatus including:

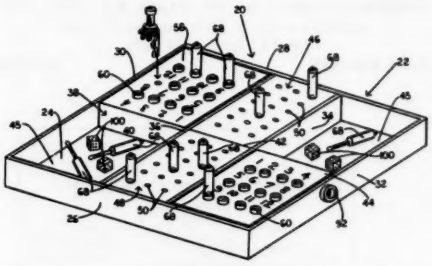
a support member;

a first board member having a plurality of spaced aligned apertures formed therin, coupled to the support member;

a first plurality of identifiable electrical sockets one of the plurality of sockets being aligned in a corresponding one of the spaced aligned apertures in the first board member;

a second board member, having a plurality of spaced aligned apertures formed therein, coupled to the support member in spaced alignment with the first board member;

a second plurality of identifiable electrical sockets one of the second plurality of sockets being aligned in a corresponding one of the spaced aligned apertures in the second board member;



a plurality of light illuminating members for insertion into anyone of the plurality of sockets;

means coupled to the first and second plurality of sockets for energizing the sockets so that upon insertion of a light illuminating member into anyone of the plurality of sockets the light illuminating member is activated; and

means for determining which one of the plurality of sockets will have a light illuminating member inserted therein.

5,069,459

GAME APPARATUS AND METHOD

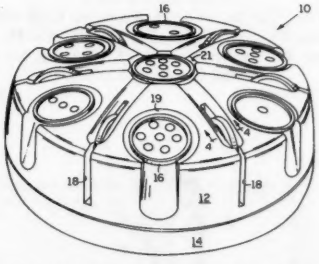
Sandor J. Zarnoti, P.O. Box 1256, Marathon, Fla. 33050

PCT No. PCT/US90/02669, § 371 Date Dec. 9, 1990, § 102(e) Date Dec. 9, 1990

Continuation-in-part of Ser. No. 350,842, May 11, 1989, Pat. No. 4,986,547. This PCT application May 11, 1990, Ser. No. 613,850

Int. Cl.[5] A63F *3/00*

U.S. Cl. 273—241 **10 Claims**



1. A method of playing a game comprising the steps of:

providing a first plurality of playing pieces, each of said playing pieces having indicia thereon representing a numerical value from 1 to 7 inclusive;

providing a second plurality of playing pieces, each of said second plurality of playing pieces having indicia thereon indicating a first special variety of playing piece;

providing a third plurality of playing pieces, each of said third plurality of playing pieces having indicia thereon indicating a second special variety of playing piece;

providing a game apparatus having a playing surface, said playing surface having a plurality of recesses formed therein for receiving and making visible a plurality of any

of said playing pieces, said recesses comprising a center recess and a plurality of peripheral recesses;

shuffling all of said playing pieces and arranging said playing pieces face down in stacks on a level surface;

each players turn including, drawing any one of said playing pieces from any of said stacks and placing said any one playing piece face up in any of said peripheral recesses, continuing until said peripheral recesses each have one of said playing pieces deposited therein; and

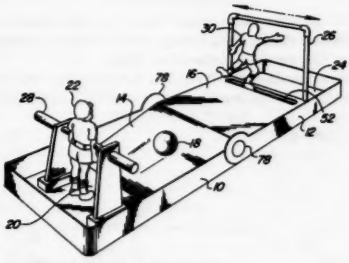
each players turn including, drawing any one of said playing pieces from any of said stacks and placing said any one playing piece face up in said center recess, looking for a winning combination of said playing pieces deposited on said playing surface wherein said winning combination comprises a numerically consecutive run of said playing pieces, said consecutive run occurring in a straight line across said playing surface or in an adjacent triangular formation about said playing surface.

5,069,460

POCKET SIZED MECHANICAL GAME

Ralph J. Kulesza, 4928 S. Kilpatrick, Chicago, Ill. 60305

Filed Dec. 7, 1990, Ser. No. 629,649
Int. Cl.[5] A63F *7/06*
U.S. Cl. 273—355 **31 Claims**



1. A pocket sized game comprising:

a playing surface

a projectile

a target

means for shooting said projectile from a starting point toward said target at a time controlled by a player, and

motorized means for varying the effect of shooting the projectile toward said target over time,

said game comprising at least two sections, each section defining a game surface and said sections cooperate to defined a closed position wherein said sections provide a compartment enclosing said game surfaces and an open position wherein said game surfaces are exposed.

5,069,461

STATIC AND DYNAMIC SHAFT SEAL ASSEMBLY

David C. Orlowski, Milan, Ill., assignor to Inpro Companies, Inc., Rock Island, Ill.

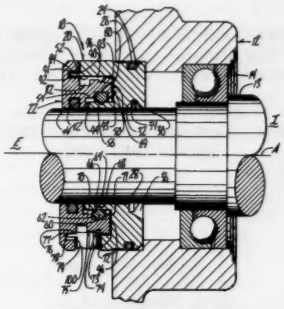
Continuation-in-part of Ser. No. 365,895, Jun. 14, 1989, Pat. No. 4,989,883. This application Dec. 5, 1990, Ser. No. 624,881
The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.
Int. Cl.[5] F16J *15/16*
U.S. Cl. 277—25 **18 Claims**

1. A bearing isolator functionally interposed between a machinery housing and a rotatable shaft extending through the housing for isolating a shaft bearing and housing interior from an environment outside the housing; the isolator comprising, in combination,

a stator member adapted for connection to the housing,

a rotor adapted to be mounted on the shaft, the stator and rotor being formed with a flange and mating recess having opposed annular, axially-extending surfaces, the rotor having a radially extending recess located to confront the annular axially-extending stator surface, and

a solid, annular, resilient seal member disposed in the recess and adapted to sealingly engage the rotor and the adjacent stator annular surface when the rotor is not in motion to



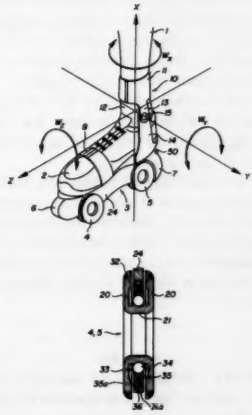
prevent egress of lubricants from the housing interior and ingress of contaminants from the environment, the seal member being adapted to be directed radially away from and out of contact with the adjacent stator surface when the rotor is in sufficient operating motion.

5,069,462

ROLLER SKATE INCLUDING AT LEAST TWO ROLLERS ALIGNED ALONG A MEDIAN PLANE

José Murga, 9C, chemin des Rouilleres, CH-2000 Neuchatel, Switzerland

Continuation of Ser. No. 369,041, filed as a PCT/CH88/00192, Oct. 17, 1988 abandoned.
This application Mar. 22, 1991, Ser. No. 675,017
Claims priority, application France, Oct. 23, 1987, 87 14884
Int. Cl.[5] A63C *17/22*
U.S. Cl. 280—23 **17 Claims**



1. In a roller skate comprising an under-frame, at least two rollers fixed on a lower part of said under-frame and aligned one behind the other along a common median plane perpendicular to their axes of rotation, and support means to fix said under-frame to a foot and to a corresponding leg of a user, the improvement wherein each one of said rollers has the shape of a narrow bobbin, including two circular flanges substantially parallel and of the same outer diameter, and a central tubular portion of lesser diameter which is integrally connected to said

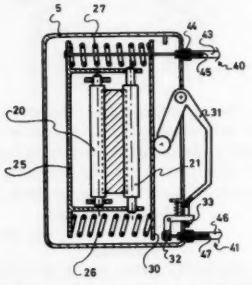
two flanges, said tubular portion being mounted inside a rolling bearing supported by said under-frame and located in said median plane, and wherein each one of said rollers is hollowed out by a central hole axially transversing the whole roller, defining the inside of said tubular portion.

5,069,463

RELEASABLE BINDING ASSEMBLY

Philippe M. Baud, Barberaz, and Frëdëric P. Bourgeois, Chambery, both of France, assignors to Salomon S.A., Annecy Cedex, France

Filed Jul. 7, 1989, Ser. No. 376,634
Claims priority, application France, Jul. 7, 1988, 88 05910
Int. Cl.[5] A63C *9/086*
U.S. Cl. 280—14.2 **28 Claims**



1. A releasable binding assembly for a gliding board comprising:

two binding elements, each binding element having a means for elastically retaining a shoe or boot and for releasing said shoe or boot upon the exertion of a biasing force exceeding a predetermined threshold,

said means for elastically retaining comprising an elastic return device and plural members biased together against an elastic return force of said elastic return device, one of said members being movable between an activated armed position, in which the shoe or boot is elastically retained by said elastic return force being applied against said movable member, and a disarmed position, in which the shoe or boot is permitted to be released.

wherein, in said disarmed position, said elastic return force applied against said movable member has a reduced magnitude for facilitating the release of said shoe or boot from its respective binding element,

said binding assembly further comprising means for operatively connecting each of said two binding elements to the other binding element, wherein said means for connecting moves said movable member of a respective binding element to said disarmed position upon the release of the shoe or boot from the respective binding element of the other shoe or boot.

5,069,464

ENGINE COMPONENT ORGANIZER

Ed Braconnier, Surrey, Canada, assignor to Gilbert Wan, Vancouver, Canada

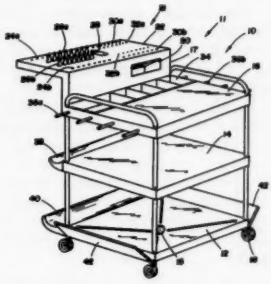
Filed Nov. 27, 1989, Ser. No. 441,519
Int. Cl.[5] B62B *3/10*
U.S. Cl. 280—47.35 **8 Claims**

1. An engine component organizer, comprising:

a wheeled cart;

a top tray affixed to said cart; and

a platform attached to said top tray and extending laterally therefrom including left and right sets of valve receptacles, left and right sets of push rod receptacles, left and right sets of hydraulic lifter receptacles, and left and right sets of conical projections, each of said left sets corresponding to parts from a left engine head and said right sets corresponding to parts from a right engine head.

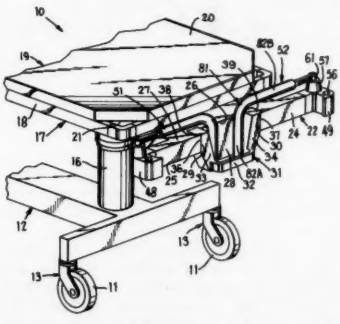


5,069,465

DUAL POSITION PUSH HANDLES FOR HOSPITAL STRETCHER

Martin W. Stryker, Kalamazoo Township, Kalamazoo County, and Thomas W. Fennell, Portage, both of Mich., assignors to Stryker Corporation, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 470,851, Jan. 26, 1990, abandoned. This application Feb. 26, 1991, Ser. No. 662,382
Int. Cl.[5] A61G *1/02*
U.S. Cl. 280—47.371 **23 Claims**



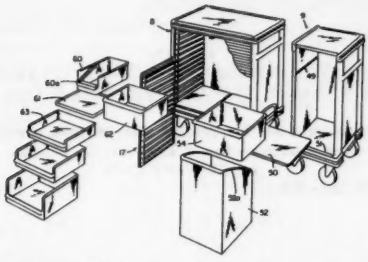
1. An apparatus comprising a movably supported vehicle which is a stretcher for a medical patient and which has an upwardly facing support surface thereon, and handle means on said vehicle in the region of one end of said support surface for facilitating manual maneuvering of said vehicle, said handle means including a handle which is approximately L-shaped and has first and second legs which extend approximately at a right angle to each other, and including support means cooperable with an outer end of said first leg for supporting said handle on said vehicle for movement between first and second positions, wherein in said first position said first leg of said handle extends substantially horizontally at a first vertical level lower than said support surface on said vehicle and said second leg extends downwardly from an end of said first leg remote from said support means, and wherein in said second position said first leg of said handle extends approximately vertically upwardly and said second leg extends approximately horizontally outwardly from an upper end of said first leg at a second vertical level which is substantially vertically higher than said support surface on said vehicle.

5,069,466

CART ASSEMBLY

Robert L. Propst, 18845 NE. 49th Pl., Redmond, Wash. 98052

Filed Jul. 14, 1989, Ser. No. 380,137
Int. Cl.[5] B62B *5/00*
U.S. Cl. 280—79.3 19 Claims



1. A cart comprising:

a generally rectangular bottom panel assembly having bottom wheel mounts adjacent its corners;

a generally rectangular top panel assembly spaced above said bottom panel assembly and including a plastic top panel with nut inserts fixed therein against rotation;

said top and bottom panel assemblies including respective bumper frames having outwardly exposed bumper faces and having horizontal portions;

vertical end panels extending between said top and bottom panel assemblies; and

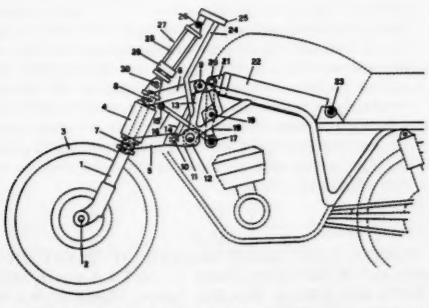
draw rod means extending vertically through the entire vertical length of said end panels and through said horizontal portions of said bumper frames, said draw rod means threadably engaging said nut inserts and engaging the bottom of said bottom panel assembly for clamping said top panel assembly and base panel assembly against the upper and lower ends, respectively, of said end panels.

5,069,467

FRONT SHOCK ABSORBING UNIT FOR MOTORCYCLES

De Bei Claudio, Via Bonamigo, 7, 36061 Bassano Del Grappa, Italy

Filed May 21, 1990, Ser. No. 526,510
Claims priority, application Italy, May 24, 1989, 8559 A/89
Int. Cl.[5] B62K *21/02*
U.S. Cl. 280—276 8 Claims



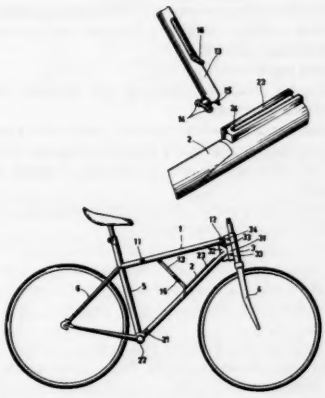
1. A front shock absorbing unit for motorcycles comprising a deformable structure with an upper fork and a lower fork, each including a plurality of arms, said forks each being pivoted on a first end to a sleeve which is integrally attached to a pair of stanchions fixed to a hub of a wheel, and, on a second end, where the forks are at their widest distance apart, the upper fork is pivoted on second end by pins to the frame of the motorcycle and the lower fork is pivoted by pins to a pair of link rods which are in turn pivoted by pins to the frame, wherein said pins located at the second end of the forks are mutually connected to a cross, and wherein those pins which are connected to the frame on each side thereof are linked in pairs by a first rod to which there is fixed a tube for supporting a handlebar, said tube being secured at a first joint by means of a structure which includes a plurality of second rods, said structure being secured at a second joint to the upper ends of the stanchions connected to the wheel hub, wherein a plate slides on said plurality of second rods, and further comprising a tie rod pivoted at one end to each of the arms of the upper fork, the other end of said tie rod being pivoted to an end of a lever which is centrally pivoted to the frame and is pivoted at its other end to one end of a shock absorbing element, said shock absorbing element being pivoted at its other end to the frame wherein said shock absorbing element extends along a longitudinal plane of symmetry of the frame.

5,069,468

COLLAPSIBLE BICYCLE

Shu-Huey Tsai, and Duan-Huey Tsai, both of 446, Chien-Kuo I Road, Sam-Min District, Kao-Hsiung City, Taiwan

Filed Aug. 14, 1990, Ser. No. 567,166
Int. Cl.[5] B62K *15/00*
U.S. Cl. 280—278 1 Claim



1. A collapsible bicycle comprising:

a top tube;

a seat tube pivotally connected to one end of said top tube;

a down tube pivotally connected at a lower end thereof with a lower end of said seat tube being collapsible at an intermediate portion thereof, said down tube having a longitudinal groove formed therein with a recess formed within said lower end;

a reinforcing tube pivotally connected at an upper end thereof with an intermediate portion of said top tube and having at the lower end two rollers and a spring-loaded positioning member adapted for displacement within the groove and the recess of said down tube respectively;

a head tube fixedly connected to said down tube and pivotally connected to said top tube;

a handlebar including a major bar and an auxiliary bar, said major bar being fixedly connected to said head tube and pivotally connected to said auxiliary bar, said major bar being pivotally connected to said head tube; and

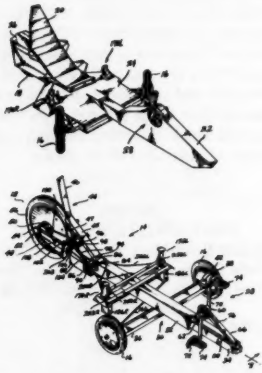
a pair of crank arms pivotally connected to an axle of said bicycle, said crank arms being foldable in alignment with a center of said axle.

5,069,469

RECUMBENT CYCLE

Brent L. Rosengrant, Redmond; Glen T. Poss, Nine Mile Falls, both of Wash., and Malcolm M. Maccabee, Drain, Oreg., assignors to H.P.E. Corporation, Kent, Wash.

Filed Jun. 10, 1987, Ser. No. 56,259
Int. Cl.[5] B62K *19/06;* **B62L** *3/02;* **B62M** *1/02, 9/16*
U.S. Cl. 280—288.1 **19 Claims**



1. A recumbent, human powered vehicle comprising:

(a) a frame structure having a forward end portion and a rearward end portion;

(b) at least one steerable wheel;

(c) means for rotatably mounting said steerable wheel on said frame structure;

(d) at least one drive wheel rotatably mounted on said frame at a location longitudinally spaced along said frame from said steerable wheel and in constant contact with the ground;

(e) a manually operable drive system drivingly interconnected with said drive wheel;

(f) brake means operably associated with said drive wheel, said brake means including a braking surface rotating with said drive wheel and a friction assembly connected to said frame structure for frictionally engaging said braking surface;

(g) a hand-operable steering and braking gimbal assembly, comprising a hand-graspable, first gimbal structure rotatably interconnected with a second gimbal structure, said second gimbal structure rotatably mounted on said frame structure whereby upon manual manipulation of said first gimbal structure, said gimbal assembly is tiltable laterally relative to said frame structure about an axis extending generally longitudinally relative to said frame structure, and is tiltable in the longitudinal direction relative to said frame structure about an axis extending generally laterally to said frame structure;

(h) first interconnection means operably interconnecting said means for rotatably mounting said steerable wheel on said frame structure to one of said first and second gimbal structures, whereby the steerable wheel is rotated in the direction that said gimbal assembly is laterally tilted upon manual manipulation of said first gimbal structure;

(i) second interconnection means operably connecting said brake means with the other of the first and second gimbal structures, whereby the brake means are actuated upon the tilting of said gimbal assembly in the longitudinal direction upon manual manipulation of said first gimbal structure;

(j) pair of gimbal assemblies located at laterally opposite sides of said frame structure;

(k) linkage means interconnecting said gimbal assemblies to constrain said gimbal assemblies to tile in unison laterally relative to the length of said frame structure; and

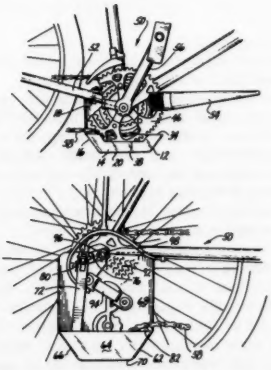
(l) wherein said second interconnection means having means interconnecting both of said gimbal assemblies to said brake means to actuate said brake means by the tilting of either or both of said gimbal assemblies in the longitudinal direction by manual manipulation of either or both corresponding first gimbal structures.

5,069,470

BICYCLE TRANSMISSION CLEANING APPARATUS

Robert A. Spencer, 31935 Via Coyote, Coto de Caza, Calif. 92679

Continuation of Ser. No. 286,286, Dec. 19, 1988, abandoned. This application Sep. 6, 1990, Ser. No. 579,106
Int. Cl.[5] F16H *57/05*
U.S. Cl. 280—288.4 **19 Claims**



1. An apparatus useful for cleaning the debris-laden transmission of an assembled bicycle having a bicycle frame, the transmission including chainrings and free wheel gear means, which apparatus comprises:

a first reservoir adapted to be secured to the bicycle in proximity to the chainrings, said first reservoir including a first receptacle adapted to hold a quantity of liquid cleaning composition and to collect debris removed from the chainrings, said first reservoir having a first securement assembly which includes a mounting plate, a bolt secured to said mounting plate, a top plate adapted to capture one or more components of the bicycle frame between said top plate and said mounting plate and to have said bolt pass through said top plate, and a nut adapted to receive said bolt to hold said component or components of said bicycle frame between said mounting plate and said top plate; and

a second reservoir adapted to be secured to the bicycle separately from said first reservoir in proximity to the free wheel gear means, said second reservoir including a second receptacle adapted to hold a quantity of liquid cleaning composition and to collect debris removed from the free wheel gear means.

5,069,471

TRAVEL AND UTILITY TRAILER COMBINATION

James A. Van Der Linden, Route 1, Box 8B, Lismore, Minn. 56155, and John J. Van Der Linden, Route 1, Box 48, Kenneth, Minn. 56147, assignors to James A. Van Der Linden, Lismore and John J. Van Der Linden, Kenneth, both of, Minn.

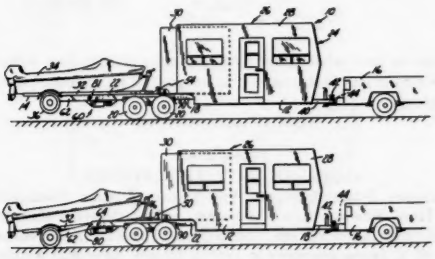
Filed Dec. 26, 1990, Ser. No. 633,931
Int. Cl.[5] B60P *3/071, 3/367*
U.S. Cl. 280—414.1 **14 Claims**

1. For use with a prime mover, a combination house vehicle and auxiliary trailer apparatus including:

(a) a longitudinally extending house vehicle operably associated with the prime mover and including a main frame carried by at least one ground-supported set of first wheels for movement on its longitudinal axis, said main frame having a main closure supported on a forward portion thereof;

(b) said main frame including a pair of parallel, spaced-apart, longitudinally extending side beams;

(c) a longitudinally extending auxiliary trailer including an auxiliary trailer frame of configuration to support an auxiliary load thereon, a second set of wheels rotatably mounted with respect to a rearward portion of the auxiliary trailer frame, and auxiliary trailer tongue means extending longitudinally forwardly from the auxiliary trailer frame;



(d) means to pivotally support said auxiliary trailer tongue means with respect to said house vehicle in a hitched position wherein said auxiliary trailer frame is between rearward portions of said main frame side beams and is pivotal with respect to said main frame on at least a horizontal axis transverse to the longitudinal axes of the house vehicle and the auxiliary trailer;

(e) means to pivot the hitched auxiliary trailer frame with respect to the main frame between a loading position with the second set of wheels on the ground and a transport position with said wheels elevated from the ground; and

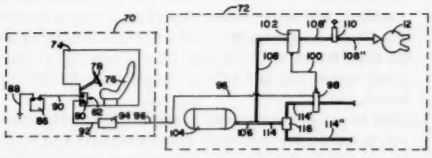
(f) means to maintain the auxiliary trailer frame in said transport position with respect to the main frame during over-the-road transport of the combination house vehicle and auxiliary trailer apparatus.

5,069,472

ELECTRONICALLY CONTROLLED FLUID RELEASE FIFTH WHEEL SAFETY MECHANISM

Timothy J. Parr, Allegan, and Gerald W. Hungerink, Holland, both of Mich., assignors to Holland Hitch Company, Holland, Mich.

Filed Jul. 31, 1990, Ser. No. 560,131
Int. Cl.[5] B62D *53/06*; B60T *7/12*
U.S. Cl. 280—433 **12 Claims**



1. A fifth wheel hitch and control comprising:

jaw means movable between a release position for releasing a king pin, and a closed position for securing the king pin;

jaw releasing power actuator means operably associated with said jaw means for shifting said jaw means from closed position to release position;

a power source to operate said power actuator means;

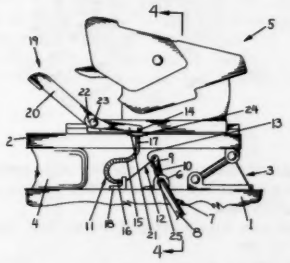
series actuator control means operably between said power source and said power actuator means comprising a cab interior first partial actuator control operable by the driver in the cab to cause only partial actuation from said power source to said power actuator means, and a cab exterior second partial actuator control operable by the driver outside of the cab to cause only partial actuation from said power source to said power actuator means, said first partial actuator control being in series with said second partial actuator control, requiring both to be operated, inside and outside of the cab respectively, to operably associate said power source with said power actuator to thereby release said jaw means.

5,069,473

SKI BRAKE

Roland Erdei, Weigelsdorf, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Jul. 18, 1990, Ser. No. 554,736
Claims priority, application Austria, Sep. 1, 1989, 2069/89
Int. Cl.[5] A63C *7/10*
U.S. Cl. 280—605 **4 Claims**



1. In a ski brake comprising two wire-braking arms supported in bearing points on a ski, which ski brake is swingable from a braking position, in which said two wire-braking arms are arranged next to side surfaces of the ski and free ends thereof extend below a running surface of the ski, into a ready position, in which a portion of said ski brake remote from said wire-braking arms is urged by a ski boot in direction of an upper side of the ski with the help of an operating pedal means pivotally supported for movement about an axle, an axis of said axle extending transversely with respect to a longitudinal axis of the ski, said free ends of said two wire-braking arms being oriented above a plane of the upper side of the ski, and a first bearing support for said wire-braking arms being arranged on the upper side of the ski, the improvement wherein a second bearing support for the operating pedal means is arranged on a spring board arranged spaced from the upper side of the ski and is movable in a direction normally with respect to the upper side of the ski relative to the ski against the force of a spring, wherein said wire-braking arms have, on a side of said first bearing support remote from said free ends, an operating member, and wherein said operating member is coupled with said operating pedal means by a device permitting the movability of the spring board in direction normally with respect to the upper side of the ski without moving said wire braking arms into said braking position.

5,069,474

DOLL-CARRIAGES

Huang M. Tai, 4 Fl., No. 302, Pai Ling 5 Rd., Taipei, Taiwan

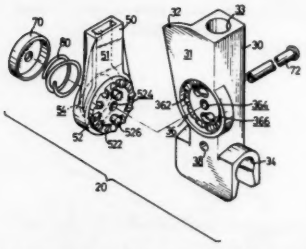
Filed Sep. 21, 1990, Ser. No. 590,028
Int. Cl.[5] B62B *7/06*
U.S. Cl. 280—658 **1 Claim**

1. In an improved doll-carriage of the type having a respective pair of front and rear support legs, a pair of linkages, a substantially U-shaped handle, a back seat linked to the handle,

a pair of retaining pieces having inner and outer faces and an annular periphery, each securely attached at an end of the handle and pivotally connected to one end of a corresponding linkage for operably moving the front support legs via the linkages, a pair of adjusting pieces, each having an inner and an outer face and an annular periphery, fixed on end portions of the back seat for securing the back seat to said retaining pieces, a cover and a spring for urging each adjusting piece to bear against a corresponding retaining piece, the improvement comprising:

on each retaining piece;

an extension wing extending rearwardly from said retaining piece and substantially occupying a crotch between the retaining piece and the adjusting piece, the crotch being formed during relative movement therebetween said extension wing having a rearwardly and downwardly extending upper edge which intersects with a downwardly and forwardly extending lower edge;



a cylindrical recess on the inner face of the retaining piece, having a plurality of first divided teeth on an annular periphery; and

at least one arcuate-shaped adjustment hole formed therein; and

on each adjusting piece:

a substantially cylindrical protrusion on the outer face thereof, said cylindrical protrusion conforming to said cylindrical recess of said retaining piece and having a plurality of second divided teeth on an annular periphery thereof, said second divided teeth facing and forming a frictional engagement with said first divided teeth on said retaining piece; and

a corresponding number of cylindrical adjustment pins in engagement with said adjustment hole for limiting an angular movement of said adjusting piece relative to said retaining piece.

5,069,475

FLUID PRESSURE TYPE ACTIVE SUSPENSION HAVING VARIABLE PERFORMANCE RESPONSIVE TO FRONT TO REAR WHEEL STEERING ANGLE RATIO

Takashi Yonekawa, Mishima; Shuuichi Buma; Toshio Aburaya, both of Toyota; Kunihito Sato, Susono; Masaki Kawanishi, Toyota; Toshiaki Hamada, Toyota, and Shinichi Tagawa, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha and Aisin Seiki Kabushiki Kaisha, both of Aichi, Japan

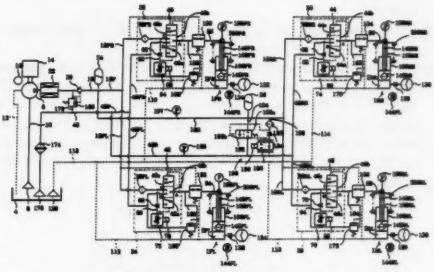
Filed Aug. 30, 1990, Ser. No. 575,553

Claims priority, application Japan, Sep. 5, 1989, 1-230244

Int. Cl.[5] B60G *11/26*

U.S. Cl. 280—707 **5 Claims**

1. A fluid pressure type active suspension in a vehicle such as an automobile having a four wheel steering means, comprising fluid pressure type actuators each provided between a vehicle body and each wheel, working fluid supply and exhaust means for supplying and exhausting a working fluid to and from each said actuator, vehicle height detection means for detecting vehicle height of a portion of the vehicle body corresponding to each said wheel relative to said wheel, and a control means for controlling said working fluid supply and exhaust means according to control parameters including a vehicle height detected by said vehicle height detection means, wherein said control means is adapted to modify the control of said working fluid supply and exhaust means in accordance with whether a



front to rear wheel steering angle ratio of said four wheel steering means is in a same phase region or an opposite phase region.

5,069,476

SUSPENSION CONTROL SYSTEM

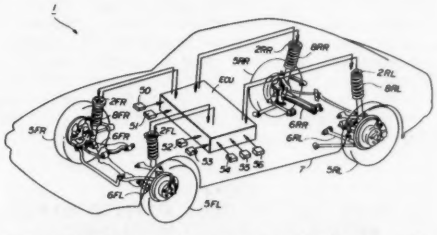
Yasuhiro Tsutsumi, Susono; Yuji Yokoya, Toyota; Yoshimichi Hara, Kuwana; Eiju Matsunaga, Anjou; Hiroyuki Kawata, Chiryu; Akira Fukami, Okazaki, and Yutaka Suzuki, Nishio, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed May 8, 1990, Ser. No. 520,185

Claims priority, application Japan, May 9, 1989, 1-115545; Dec. 29, 1989, 1-341370; Jan. 12, 1990, 2-4874

Int. Cl.[5] B60G *11/28*

U.S. Cl. 280—707 **25 Claims**



1. A suspension control system for controlling suspensions provided for wheels of a vehicle, said wheels being a left front wheel, a right front wheel, a left rear wheel and a right rear wheel, said suspension control system comprising:

driving condition detecting means for detecting a driving condition of said vehicle;

determination means, coupled to said driving condition detecting means, for determining whether or not said driving condition coincides with a predetermined driving condition, said suspensions being grouped into a plurality of groups, said groups being a first group comprising said left front wheel and said right front wheel and a second group comprising said left rear wheel and said right rear wheel; and

control means, coupled to said suspensions and said determination means, for separately controlling said suspensions of said left front wheel, said right front wheel, said left rear wheel and said right rear wheel when said determination means determines that said driving condition detected by said driving condition detecting means does not coincide with said predetermined driving condition and for controlling said suspensions of each of said first and second groups, when said determination means determines that said driving condition coincides with said predeter-

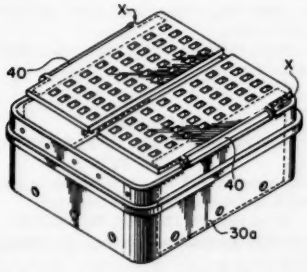
mined driving condition, so that said suspension related to said right front wheel is set to a condition identical to said suspension related to said left front wheel and said suspension related to said right rear wheel is set to a condition identical to said suspension related to said left rear wheel.

5,069,477

PAD FOR AIR BAG DEVICE

Kouji Shiraki, Gifu, Japan, assignor to Toyoda Gosei Co., Ltd., Nishikasugai, Japan

Filed Aug. 20, 1990, Ser. No. 569,917
Claims priority, application Japan, Oct. 30, 1989, 1-126748[U]
Int. Cl.[5] B60R *21/16*
U.S. Cl. 280—732 9 Claims



1. A pad for covering an inflatable air bag for use in an air bag device, comprising:

an insert member of a generally box-shape made of a synthetic resin and having an upper wall openable upon inflation of the air bag and side walls extending downwardly from a peripheral edge of said upper wall;

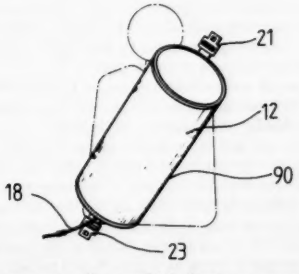
a covering member made of synthetic resin having ribs formed on an underside thereof positioned such that said ribs contact said insert member upper wall so as to define a gap between said covering member underside and said insert member upper wall, said covering member further including a weakened portion.

5,069,478

ELECTROMAGNETIC INFLATOR USED IN COMPACT VEHICLE AIR BAG APPARATUS

Ki I. Kim, 826 South Berendo St., Los Angeles, Calif. 90005

Filed Jul. 24, 1990, Ser. No. 556,967
Int. Cl.[5] B60R *21/10*
U.S. Cl. 280—733 4 Claims



1. Safety apparatus for a vehicle having a passenger compartment and a shoulder belt for restraining an occupant of the vehicle comprising:

inflatable bag mounted on a portion of said shoulder belt and movable between a collapsed, inoperative position and an inflated, operative position, for restraining an occupant of the vehicle during a collision;

means operatively associated with said air bag for automatically inflating said bag when energized by a sensor signal, said inflating means comprising a container for pressurized gas, first and second magnetic means mounted within said container, said first magnetic means positioned adjacent a member having an opening which allows gas to exit from said container, said first magnetic means being in a first position when said sensor signal is generated and in a second position when said sensor is not generated, gas being released from said container to inflate said bag when said member is in said first position; and

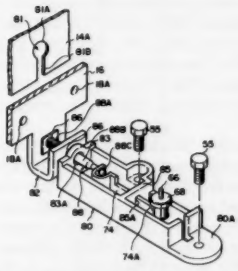
sensor means operatively associated with said vehicle for generating said sensor signal when a collision condition is detected.

5,069,479

AIR BAG DEVICE

Teruhiko Koide; Kozi Buma; Takashi Ogasawara, and Hiroaki Shinto, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Aug. 3, 1990, Ser. No. 562,261
Claims priority, application Japan, Aug. 9, 1989, 1-93523[U]
Int. Cl.[5] B60R *21/32*
U.S. Cl. 280—734 20 Claims



1. An air bag device for a vehicle to be put in operation in case of an emergency, comprising:

(a) an air bag main body in which an air bag is accommodated,

(b) inflating means accommodated in the air bag main body for inflating the air bag,

(c) an acceleration sensor accommodated in the air bag main body for detecting a large deceleration to actuate inflating means,

(d) mounting means for mounting the air bag main body to a body of the vehicle,

(e) acceleration-sensor deactivating means which takes a first state in which the operation of the acceleration sensor is disabled even if a large acceleration is imposed and a second state in which the operation of the acceleration sensor is activated,

(f) releasing means for releasing the deactivating means to put the acceleration sensor in an activated state, and

(g) restricting means for preventing the mounting means from achieving its function of attaching the air bag main body to the body of the vehicle when the acceleration-sensor deactivating means is in the second state and allowing the mounting means to achieve its function when the acceleration-sensor deactivating means is in the first state,

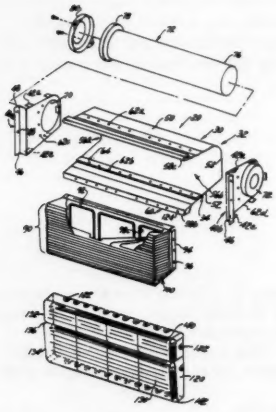
whereby the air bag is prevented from being inflated accidentally in response to an impact imparted before the air bag main body is attached to the body of the vehicle.

5,069,480

AIR BAG RETAINER ASSEMBLY

Stanley B. Good, Richmond, Mich., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed May 31, 1989, Ser. No. 359,237
Int. Cl.[5] B60R *21/20*
U.S. Cl. 280—743 **9 Claims**



1. An air bag assembly (20) comprising:

a reaction housing assembly (30) comprising a first member (34) defining top (50), bottom (52) and rear wall (54), and a plurality of end plates (40*a*,*b*) adapted to mate with open ends (56*a*,*b*) of the first member (34), the first member (34) and end plates (40*a*,*b*) defining an open mouth (44);

the end plates including means for securing a gas generator thereto;

a pillow assembly (90) including a pillow retainer (92) received into and recessed rearward of the open mouth (44), and circumferentially secured to the reaction housing assembly and an inflatable pillow (100) or air bag attached to the pillow retainer (82); the pillow stored in a compact, predeployment condition prior to inflation;

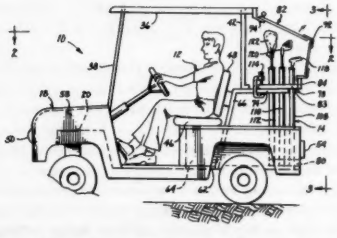
cover assembly means (120) for protecting the pillow (100) in its predeployment condition, the cover assembly means (120) being ruptured by the pillow (100) during deployment thereof.

5,069,481

GOLF CART CLUB RACK AND METHOD

William M. Strange, 12514 Eveningside Dr., Sun City West, Ariz. 85375

Filed Aug. 6, 1990, Ser. No. 562,825
Int. Cl.[5] B60R *9/06, 9/08*
U.S. Cl. 280—769 **6 Claims**



1. A golf cart club-rack for connection to a vertical rear-mounted support means of a golf cart body comprising:

a horizontal upper panel coupled to the vertical support means and having a plurality of openings;

adjustable connector means coupling the horizontal upper panel to the vertical support means;

a plurality of vertical tubes extending through respective openings provided by said plurality of openings and supported by the horizontal upper panel for holding a set of golf clubs; and

a foldable, multi-piece cover coupled to said horizontal upper panel and disposed over the clubs and tubes and horizontal upper panel; said cover includes:

a bottom transparent plate having lower hinge means disposed along a lower edge thereof; a vertical transparent portion for interconnecting the lower hinge means to the horizontal upper panel; and

a top transparent plate having lower hinge means disposed along a lower edge thereof and connected to the bottom transparent plate;

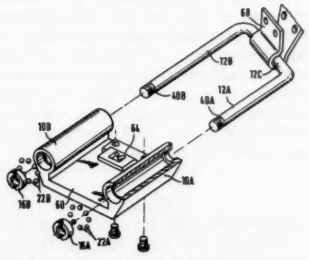
said top transparent plate having latch means disposed along a top edge thereof.

5,069,482

FORCE LIMITER FOR SAFETY BELT RESTRAINING SYSTEMS

Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to TRW Repa GmbH, Alfdorf, Fed. Rep. of Germany

Filed Sep. 28, 1990, Ser. No. 590,089
Claims priority, application Fed. Rep. of Germany, Oct. 9, 1989, 3933721
Int. Cl.[5] B60R *22/28*
U.S. Cl. 280—801 **2 Claims**



1. A force limiter for use in a safety belt restraining system having a force flow path and first and second fittings, said force limiter comprising:

a fitting plate having parallel edges and having two spaced-apart parallel cylinders formed therein along said edges, and two rods associated each with a respective cylinder and having ends projecting out of the cylinders, said ends of said rods being connected by a stirrup member to which the second fitting is secured; and

at least one of said cylinders engaging the first fitting of the safety belt restraining system and its respective rod being longitudinally displaceably accommodated in said one cylinder and said force limiter being inserted via the first and second fittings into the force flow path of the safety belt system, said force limiter comprising an annular free space defined radially inwardly by the rod, radially outwardly by the inner wall of the cylinder and axially on at least one side by an annular shoulder, an annular array of roller elements being arranged in said annular free space and uniformly distributed in the peripheral direction, the cylinder being made of a plastically deformable relatively soft material, the roller elements being made of a relatively hard material, the annular array of roller elements having a diameter selected such that upon longitudinal displacement of said rod in said cylinder said roller elements penetrate into the material of the cylinder and perform a deformation work on the inner wall of the latter

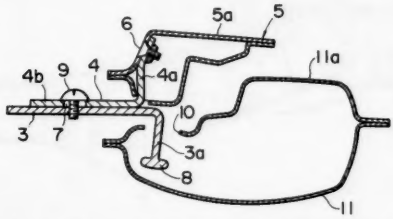
resulting in the formation of longitudinal grooves into the material of the cylinder, to thereby define a reproduceably defined inhibiting force when the rod and the cylinder are pulled apart under tensile load between the fittings of the safety belt restraining system.

5,069,483

SEAT BELT MOUNT MECHANISM

Kiyoshi Hirasawa, Hamamatsu, Japan, assignor to Suzuki Motor company Limited, Japan

Filed Jun. 13, 1990, Ser. No. 537,359
Claims priority, application Japan, Jun. 14, 1989, 1-69184[U]
Int. Cl.[5] B60R *21/10*
U.S. Cl. 280—801 **3 Claims**



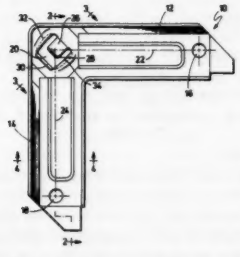
1. A seat belt mount mechanism of a seat belt for use in an automotive vehicle, comprising: a fixing bracket fixed to an upper part of a door sash, said fixing bracket extending laterally of said door sash; an anchor plate connected to said fixing bracket laterally of said door sash, said anchor plate having an end with a latch engagement portion having a substantially T-shaped cross section; an opening formed in a center pillar of the vehicle, said end of T-shaped cross section of said latch being inserted into the opening of the center pillar when the door is closed, said latch being directly received by the central pillar when the anchor plate is subjected to a heavy load.

5,069,484

DUCT JOINING SYSTEM

Howard J. McElroy, Cedar Rapids, Iowa, assignor to Met-Coil Systems Corporation, Cedar Rapids, Iowa

Filed Feb. 9, 1990, Ser. No. 478,238
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—39 **43 Claims**



1. A method of joining the rectangular ends of two ducts, the method of comprising the steps of:

attaching an L-shaped connector having two substantially perpendicular legs forming a corner region to each corner of each duct end, each said connector having an orifice in the corner region thereof;

placing said duct ends in an abutting relationship such that the L-shaped connectors on each duct corner abut each other and have abutting orifices in superimposed relationships;

integrally forming a cleat with and extending inwardly from the peripheral edge of at least one of the abutting orifices;

forming a lip on the outer end of each cleat and a retaining means on the abutting connector; and

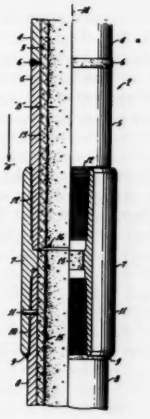
bending the cleat through the abutting orifice over and around the retaining means on the abutting connector to lock the two connectors together.

5,069,485

BRITTLE LINED PIPE CONNECTOR

William C. Allen, Pasadena; Stephen D. Pye, Los Angeles; Gerald M. Hamblin, St. Helena; Jose M. Perez, Calexico; William E. Amend, Yorba Linda; John D. Bush, Burmuda Dunes, all of Calif.; David Holligan, Muntin Lupa, Philippines, and Delbert E. Pyle, Northridge, Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Oct. 26, 1989, Ser. No. 427,758
Int. Cl.[5] F16L *9/14*
U.S. Cl. 285—55 **4 Claims**



1. A connector apparatus for joining two pipe sections containing a hard-to-handle fluid, the apparatus comprising:

a first pipe section having an interior passageway and composed of a non-fluid-resistant material;

a first substantially rigid, pipe end segment composed of a first fluid-resistant material and attached to one of said two pipe sections, the segment having two segment ends and a primary sealing surface proximate to one segment end;

a brittle fluid-conducting liner substantially covering said interior passageway, the liner composed of a second fluid-resistant material which is dissimilar from said first fluid-resistant material and having a liner end surface proximate to said one segment end, the liner attached to the interior passageway and sealably bonded to the first segment;

a second pipe section having at least one mating sealing surface for sealably mating with the primary sealing surface when the pipe sections are joined; and

means for joining the pipe sections, wherein the mated sealing surfaces are capable of restricting the passage of fluid to the pipe sections when the pipe sections are joined in the absence of a deformable seal sandwiched between said liner end surface and said second pipe section.

5,069,486

FLEXIBLE SUPPORTING SHEATH FOR CABLES AND THE LIKE

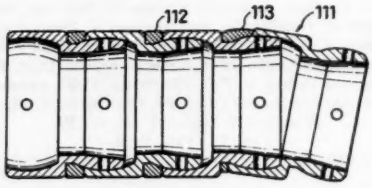
Akira Kimura, Kyoto; Nobuo Kitao, Yamatokouriyama; Hiroshi Yasuda, Takatsuki; Yoshimasa Shimomura, Daito; Kiyoshi Isozaki, and Hiroshi Nishimura, both of Osaka, all of Japan, assignors to Tsubakimoto Chain Co., Japan

Division of Ser. No. 177,526, Apr. 4, 1988, which is a division of Ser. No. 849,029, Apr. 7, 1986, Pat. No. 4,739,801. This application Apr. 12, 1990, Ser. No. 508,938

Claims priority, application Japan, Apr. 9, 1985, 60-75698; Apr. 22, 1985, 60-86983; Feb. 15, 1986, 61-29917; Feb. 17, 1986, 61-30951; Feb. 18, 1986, 61-31932; Feb. 19, 1986, 61-32879

Int. Cl.[5] F16L *27/04*

U.S. Cl. 285—166 **6 Claims**



1. A flexible supporting sheath for cables and the like comprising a series of interconnected links, each link having an internal passage extending through it form one end to the other, said internal passage having circular transverse cross-sections throughout its length, an inner concave spherical surface formed in the passage at one end of the link, and an outer convex spherical surface formed on the outer surface of the link at its opposite end, in which, for at least two adjoining links of the sheath, the convex surface of one of said two links is engaged with a concave surface of the other one of said two links, in which the engaged convex and concave surfaces having coinciding centers, and in which the concave surface of said other link overlaps the convex surface of said one link to an extent such as to prevent separation of the links, said two adjoining links having means for limiting their articulation, the internal passage of each of said two links having an intermediate portion located between the concave surface of its passage and the end portion of the passage inside the portion of the link having the outer convex surface, characterized by the fact that the diameter of said end portion of the passage of said one link, at its opening, is greater than the minimum diameter of the intermediate portion of the passage of said other link, whereby said two links form a continuous hollow passage for a cable or the like, said pair of mating concave and convex spherical surfaces being provided with at least one set of aligned radial holes and having a pin extending at least partly into both holes of at least one set, the pin being press fit into one hole of the set and fitting loosely in the other hole of the set.

5,069,487

FLEXIBLE CONNECTOR

Michael W. Sheppard, Batavia, Ill., assignor to Flexonics Inc., Bartlett, Ill.

Filed Feb. 8, 1990, Ser. No. 476,838

Int. Cl.[5] F16L *27/00*

U.S. Cl. 285—226 **21 Claims**

1. A flexible connector for accommodating a variety of different conduit configurations, and for absorbing noise and vibration through a freely flexible, fully orientatable construction, said flexible connector comprising:

tubular bellows means having two oppositely disposed ends, said tubular bellows means having a bellows portion thereof arranged substantially adjacent each of said two ends respectively;

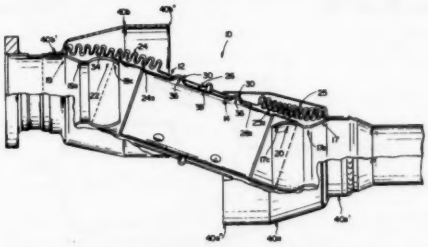
an input coupling member positioned at one end of said tubular bellows means;

an output coupling member positioned at the other end of said tubular bellows means;

tubular liner means having opposed ends and operably arranged between said input coupling member and said output coupling member to enable fluid communication therebetween, said tubular liner means arranged inside of and substantially coaxially with said tubular bellows means; and

two articulated joints, each of which is located at a respective end of said tubular liner means,

one of said articulated joint means operably connecting said respective end of said tubular liner means with said input



coupling member, and the other of said articulated joint means operably connecting the other respective end of said tubular liner means with said output coupling member,

each of said articulated joint means being operably disposed to permit substantially unrestricted angular movement of said coupling members relative to the longitudinal axis of said tubular liner means as well as to each other to, in turn, enable the longitudinal axis of said input coupling member to alternatively be positioned either intersecting or non-intersecting to the longitudinal axis of said output coupling.

5,069,488

METHOD AND A DEVICE FOR MOVEMENT-COMPENSATION IN RISER PIPES

Jan Freyer, Hafrsfjord, and Arnfinn Nergaard, Hinna, both of Norway, assignors to Smedvig IPR A/S, Stavanger, Norway

PCT No. PCT/NO89/00116, § 371 Date Jul. 3, 1990, § 102(e) Date Jul. 3, 1990, PCT Pub. No. WO90/05236, PCT Pub. Date May 17, 1990

PCT Filed Nov. 8, 1989, Ser. No. 536,668

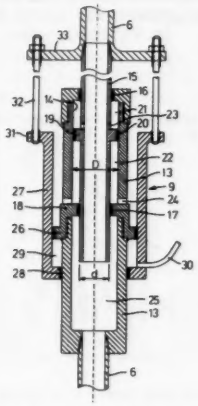
Claims priority, application Norway, Nov. 9, 1988, 88 5006

Int. Cl.[5] F16L *27/12*

U.S. Cl. 285—302 **12 Claims**

7. A telescopic device for absorbing variations in the length of a pipe, comprising a telescope casing with an internal cylinder surface, a telescopic pipe which has an external cylinder surface and is sealedly and slidingly arranged in the telescope casing, an annular piston on the outside of the telescopic pipe in contact with the internal cylinder surface of the telescope casing so that a chamber is formed on either side of the piston, one of which has pressure communication with the inside of the telescope casing and the other of which communicates with a source of fluid at substantially constant pressure, the cross sectional area of the internal cylinder surface of the telescope casing being twice the cross sectional area of the external cylinder surface of the telescopic pipe, wherein the telescopic device is adapted to function as a sliding joint in a riser pipe between a mobile offshore structure and a petroleum

well on a sea-bed, and wherein a hydraulic cylinder for providing movement-compensated tension loading of a part of the



riser pipe which is below the telescopic device is combined with the telescopic device.

5,069,489

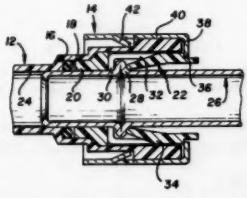
BLEED-DOWN CONNECTOR ASSEMBLY

Donald D. Bartholomew, Marine City, Mich., assignor to Proprietary Technology, Inc., Southfield, Mich.

Division of Ser. No. 327,797, Mar. 23, 1989, which is a continuation-in-part of Ser. No. 776,644, Sep. 16, 1985, which is a continuation-in-part of Ser. No. 360,201, Mar. 22, 1982, which is a continuation-in-part of Ser. No. 201,711, Oct. 29, 1980, Pat. No. 4,423,892. This application Mar. 21, 1990, Ser. No. 496,659

Int. Cl.[5] F16L *37/12*

U.S. Cl. 285—319 **8 Claims**



1. A connector assembly for providing a bleed-down connector positioned with a tubular conduit which is adapted to convey a pressurized fluid, comprising:

housing means for receiving said conduit;

sealing means for providing a fluid tight connection between confronting portions of said housing means and said conduit when said conduit is in a fully inserted position in said housing means;

retainer means for maintaining said conduit in said housing means, said retainer means including a detent having a U-shape in cross section; and

cap means rotatably mounted on said housing means for controlling the axial position of said retainer means in cooperation with housing means such that said conduit is permitted to be partially withdrawn from said housing means with the rotation of cap means to said bleed-down connector position in which said sealing means fluid tight connection is interrupted and a flange extending radially angularly from said cap means into said housing means for interacting with said detent to prevent unwanted withdrawal of said retainer means.

5,069,490

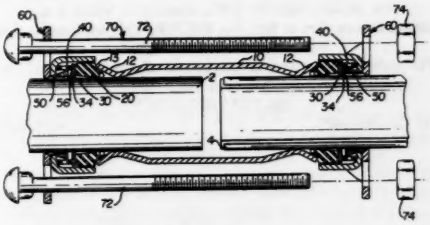
PIPE COUPLING WITH SPRING OFF-SET

Richard M. Halen, Jr., Pittsburgh, Pa., assignor to Coupling Systems, Incorporated, Pittsburgh, Pa.

Filed Oct. 6, 1989, Ser. No. 418,122

Int. Cl.[5] F16L *17/00, 19/00, 21/02*

U.S. Cl. 285—337 **15 Claims**



1. A coupling for pipes comprising:

(a) a central elongate sleeve having opposite flared ends, a longitudinal midpoint and adapted to receive coaxially two opposite pipe ends to be connected;

(b) a pair of annular gasket members positioned within said opposite sleeve ends, said gasket members having longitudinal innermost gasket ends adapted to be received by the flared ends of said central sleeve and said gasket members having a longitudinal outermost end;

(c) a pair of annular backup rings positioned longitudinally outwardly of said gasket members;

(d) a pair of independent metal annular wave springs positioned longitudinally outwardly of said backup rings, said wave springs having a longitudinal innermost surface and a longitudinal outermost surface;

(e) a pair of collapsible split ring annular gripping members positioned longitudinally outwardly of said backup rings, said gripping members having gripping teeth on a circumferential inside surface thereof, said teeth adapted to engage said pipe ends when said gripping members are collapsed;

(f) a pair of follower members positioned longitudinally outwardly of said wave springs and gripping members, said follower members having longitudinal outer flange portions having substantially flat inner bearing surfaces; and

(g) tightening means engaging said follower members for providing inward force on said follower members to urge said follower members relatively closer together and toward said longitudinal midpoint of said sleeve whereby, as force is applied, inward motion of the follower members initially causes force to be transferred from the follower members through said wave springs to the gaskets thereby causing partial gasket compression, thereafter causes said wave springs to compress in only a longitudinal direction and causes said backup rings to contact and collapse said gripping members and said gripping teeth to engage said pipe ends, whereby said compressed wave springs store energy to reduce torque loss of said tightening means caused by stress relaxation of said pipes or said gaskets.

5,069,491

VEHICLE DOOR LOCK SYSTEM

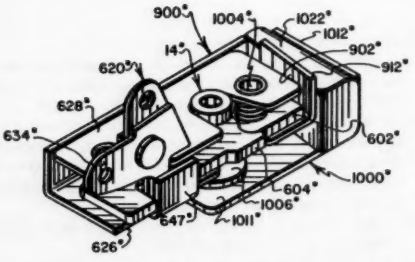
Lee S. Weinerman, Medina, and Joel T. Vargus, Parma, both of Ohio, assignors to The Eastern Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 456,048, Dec. 26, 1989, abandoned, Ser. No. 109,479, Oct. 16, 1987, Pat. No. 4,896,906, Ser. No. 390,214, Aug. 7, 1989, Pat. No. D. 319,001, Ser. No. 390,669, Aug. 7, 1989, Pat. No. D. 311,323, and Ser. No. 390,671, Aug. 7, 1989, Pat. No. D. 311,324, said Ser. No. 390,214, Ser. No. 390,669, and Ser. No. 390,671, each is a continuation-in-part of Ser. No. 320,894, Mar. 9, 1989, abandoned, which is a continuation of Ser. No. 222,349, Jul. 20, 1988, abandoned, which is a continuation of Ser. No. 106,934, Oct. 5, 1987, abandoned, which is a continuation of Ser. No. 830,709, Feb. 18, 1986, abandoned, said Ser. No. 456,048, is a continuation of Ser. No. 320,894, , which is a continuation of Ser. No. 222,349, , which is a continuation of Ser. No. 106,934, , which is a continuation of Ser. No. 830,709, , said Ser. No. 109,479, is a continuation-in-part of Ser. No. 106,934, , and Ser. No. 54,687, May 27, 1987, abandoned, which is a continuation-in-part of Ser. No. 830,709,. This application Jan. 29, 1990, Ser. No. 472,208

The portion of the term of this patent subsequent to Jan. 30, 2007, has been disclaimed.

Int. Cl.[5] E05C *3/26*

U.S. Cl. 292—48 43 Claims



1. A rotary latch assembly, comprising

a) striker means including a L-shaped bracket having an elongate central portion that interconnects with an end formation, and that has a generally cylindrical stud that is connected to the central portion and extends in cantilevered fashion at a spaced distance from the end formation;

b) rotary latch means including elongate latch housing means for defining a protective enclosure for latch operating components, and having means for defining an end region;

c) rotary latch bolt means including a pair of pivotal latch bolts mounted by the latch housing means for rotation in unison between latched and unlatched positions, and being operative, when in their latched positions, to securely grasp the stud that is carried by the L-shaped bracket of the striker means to releasably retain the rotary latch means in engagement with the striker means;

d) wedge block means including a wedge block member rigidly secured to the end formation of the L-shaped bracket of the striker means for defining an inclined surface that faces toward said stud;

e) inclined surface means defined by the end region of the latch housing means for engaging the inclined surface of the wedge block means when the rotary latch means is brought into latching engagement with the striker means to guide the rotary latch means into proper alignment with the striker means during latching and to retain the rotary latch means in proper alignment with the striker means while latched.

5,069,492

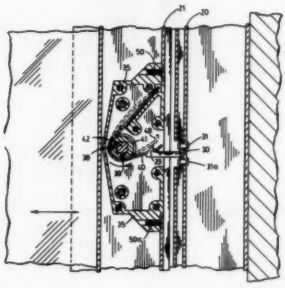
AUTOMATIC SLIDING DOOR LATCH

Gerald F. Tatham, 1391 W. Shaw Ave., Fresno, Calif. 93711

Continuation-in-part of Ser. No. 532,196, Jun. 1, 1990, abandoned. This application Feb. 6, 1991, Ser. No. 652,443

Int. Cl.[5] E05C *19/06*

U.S. Cl. 292—85 12 Claims



1. An automatic sliding door or window latching mechanism comprising:

a. a hook means attached to a door or window jamb;

b. a housing attached to a door or window frame opposite said hook means;

c. a rotatable drum having a square opening through the center thereof rotatably mounted within said housing;

d. a bendable plate member fixedly attached to said drum, said plate member having an upwardly bent lip on one end, and a central opening immediately adjacent to said lip, said plate mounted within said housing so that the lip and central opening of said plate are directly opposite the hook, the opposite end of said plate being fixedly anchored to said housing;

e. a square axle slidably passing through the squared opening in said drum, and attached on its opposite ends to a pair of handle means;

f. means for attaching said housing to said door or window;

g. means for attaching said handle means to said axle;

h. means for attaching said handle means to said door or window.

5,069,493

DOOR LOCK DEVICE

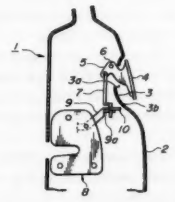
Haruo Mochida, and Yoshio Watanuki, both of Kanagawa, Japan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Jan. 3, 1991, Ser. No. 637,238

Claims priority, application Japan, Jan. 25, 1990, 2-15444

Int. Cl.[5] E05C *3/26*

U.S. Cl. 292—336.3 9 Claims



1. A door lock device for use with a door having an outer panel, said door lock device comprising:

an outside handle operatively mounted on said outer panel;

a door lock proper installed in said door and having an outside lever which is directed toward said outer panel,

said outside lever bringing about an unlatched condition of said door lock proper when moved in a given direction;

a connecting rod connecting said outside handle with said outside lever, so that movement of said outside handle in one direction causes movement of said outside lever in said given direction; and

means for establishing a locked engagement between said outside lever and said outer panel when they are brought into abutment with each other, said means including a pointed portion provided on the leading end of said outside lever.

5,069,494

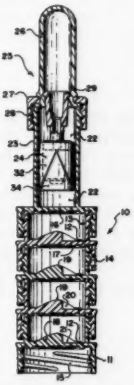
DEVICE FOR STORAGE AND INSERTION OF CONTACT LENSES

Lorne R. Reinson, White City; Mark J. Akerman, Regina, and John Klippenstein, White City, all of Canada, assignors to Lens-O-Matic Inc., White City, Canada

Filed Oct. 5, 1990, Ser. No. 592,456

Int. Cl.[5] A61F *9/00*; A45C *11/00*

U.S. Cl. 294—1.2 11 Claims



1. A device for storage of and for application to the eye of a wearer of a pair of contact lenses, the device comprising suction means for generating a suction and a head member mounted on said suction means for transmission of suction thereto and arranged for engaging and grasping the contact lens, said head member including suction communication means arranged to transmit said suction to said lens to hold said lens on said member, container means defining a first container for receiving liquid, said first container having a base for resting on a support surface and an open top, said suction means including cap means for engaging onto and closing said open top of said first container whereby the head member is stored in the liquid, said head member being arranged such that said suction means is arranged to draw said liquid into said head member whereby said suction is communicated to said lens by contact of said liquid with said lens, said container means including a second and a third container each separate from the first container and each including means for sealingly closing the respective container such that the container is arranged for receiving and storing a lens stored separately from said first container.

5,069,495

DEVICE FOR LIFTING BOARDS

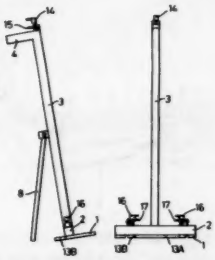
Denis P. Mears, 20A Ravenscroft Rd., Beckenham, Kent BR34TR, United Kingdom

Filed Dec. 20, 1989, Ser. No. 453,608

Claims priority, application United Kingdom, Dec. 21, 1988, 8829773

Int. Cl.[5] B65G *7/12*; B66F *11/00*

U.S. Cl. 294—15 15 Claims



1. A hand-held device having a lower end and an upper end for lifting and carrying a door and for fitting a door within a door frame, the device comprising:

support means for placing under an edge of a door, the support means having spaced apart portions for stably supporting the door either side of its centre of gravity;

a body portion attached to the support means and extending upwardly therefrom;

a handle portion attached to the body portion at a position spaced from the support means for gripping and lifting the device by hand; and

a foot mechanism having a foot portion which may be extended from a lower end of the device to engage the ground and holding means for releasably holding the device in a stable raised position on the extended foot portion and at a desired height and a desired angle, in the plane of the door, with respect to the ground, wherein the height and the angle of the support means relative to the ground, when the device is at least substantially vertically aligned, are infinitely variable,

whereby a door may be lifted and carried with one edge resting on the support means and one face leaning against part of the body portion, the handle portion being positioned such that the handle portion can be freely gripped to lift the device without interference from the door supported thereon, and whereby a door positioned upright on the device may be fitted within a door frame and stably supported in a raised position above the ground at a desired angle thereto to facilitate securement of the door within the door frame.

5,069,496

CHAIR WITH ADJUSTABLE SEAT AND BACK REST

Günther Kunh, Bliesstrasse 80, D-6680 Neunkirchen, and Ullrich Kuhn, Konrad-Adenauer-Weg 4, D-6682 Ottweiler, both of Fed. Rep. of Germany

Filed Oct. 13, 1989, Ser. No. 421,522

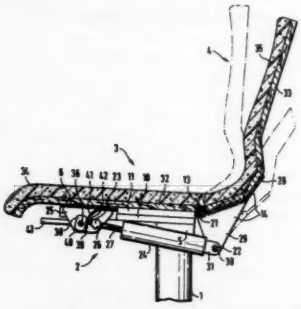
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1988, 3835003

Int. Cl.[5] H47C *3/00*

U.S. Cl. 297—300 20 Claims

1. A chair having a total of three fulcral pivots and comprising a leg having an upper portion; a seat having a profiled first base element; a first cushion provided on and following the profile of said first base element; a back rest having a second profiled base element, said base elements having adjacent edge faces; a second cushion provided on and following the profile of said second base element; a carrier connecting said seat to the upper portion of said leg, said carrier being rigid with said

upper portion and with said seat; a first fulcral pivot including a hinge disposed between said edge faces and pivotally mounting said back rest on said carrier and including means for biasing said back rest forwardly; and means for movably coupling said back rest to said carrier, said coupling means consist-



ing of a support rigid with said back rest, hydraulic damper means disposed between said support and said carrier and spaced apart from said back rest a second fulcral pivot connecting said damper means to said support, and a third fulcral pivot connecting said damper means to said carrier.

5,069,497

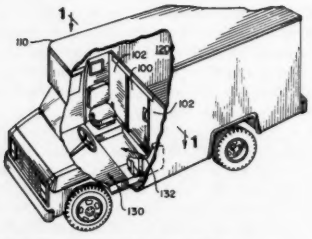
PARCEL VAN DOOR

William F. Clelland, Columbia, Mo., assignor to Ryder Truck Rental, Inc., Miami, Fla.

Filed Feb. 6, 1991, Ser. No. 651,196

Int. Cl.[5] B60J *5/06*

U.S. Cl. 296—155 **10 Claims**



1. A vehicle door assembly comprising:

a supporting wall, said wall having a passageway;

a door panel disposed substantially parallel to said wall, said door panel being slidably mounted in spaced parallel relation to said wall for bilateral movement between an open position and a closed position;

at least one seal means extending perpendicularly from said door panel toward said wall; and

at least one jamb means extending from said wall toward said door panel for engaging said seal means, said jamb means having first and second vertical edges, said jamb means inclined between said edges in the direction of movement of said door panel.

5,069,498

PICKUP TRUCK RETRACTABLE ENDGATE AIR FOIL

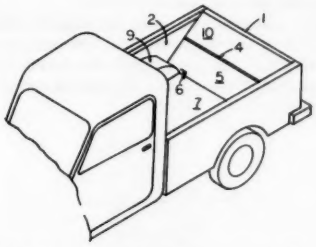
Larry J. Benchoff, 315 Geiser Ave., Waynesboro, Pa. 17268

Filed Aug. 22, 1990, Ser. No. 571,167

Int. Cl.[5] B62D *35/00*

U.S. Cl. 296—180.1 **4 Claims**

1. A combined extendable and retractable air foil for a pickup truck or car having an upper edge of an upper panel hingedly connected to the upper edge portion of an endgate, a lower panel telescopically slidably connected to the upper panel, the lower panel being extended from the upper panel with the lower edges of the lower panel resting against the rear portions of the wheelwells in this operative use position, the



lower panel being retracted into the upper panel and resting against the inner surface of the endgate when not used as an air foil, means for maintaining the air foil in its use and non-use position.

5,069,499

MOTOR VEHICLE HATCHBACK AND A METHOD FOR PRODUCING SAME

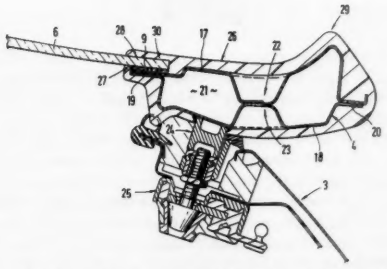
Hermann Burst, Rutesheim; August-Wilhelm Gösse, Mönsheim; Günter Scädlich, Weil der Stradt, and Georg Hötzer, Schwieberdingen, all of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany

Filed Nov. 13, 1990, Ser. No. 611,655

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1989, 3938476

Int. Cl.[5] B60J *1/04*

U.S. Cl. 296—201 **10 Claims**



1. A hatchback for a motor vehicle, comprising a window with a circumferential edge area, a bordering frame which surrounds and is glued together with the circumferential edge area of the window, and an elastic covering part which extends at least partially around the circumferential edge area of the window and the bordering frame and which, along the circumferential edge area where it extends, is directly applied by a foaming process around substantially an entire cross-sectional outer surface of the bordering frame and the circumferential edge area of the window.

5,069,500

VENTILATION ROOF FOR VEHICLES

Peter Reihl, Munich; Arpad Fuerst, Germering; Bernhard Wingen, Feldkirchen; Alfred Schmid; Thomas Schreiter, both of Munich, and Erich Haendler, Starnberg, all of Fed. Rep. of Germany, assignors to Webasto AG Fahrzeugtechnik, Fed. Rep. of Germany

Filed May 21, 1990, Ser. No. 525,603

Claims priority, application Fed. Rep. of Germany, May 24, 1989, 3916905; Sep. 14, 1989, 3930755

Int. Cl.[5] B60J *7/053*

U.S. Cl. 296—214 **24 Claims**

24. In a ventilation roof for a vehicle with a roof opening made in a fixed roof skin that can be closed by a cover that is actively connected on both sides to an adjustment mechanism having front and rear height adjustment devices, the cover being swingable by the front height adjustment devices, starting from a closed position, around a pivot axis lying near a rear edge of the cover, into a ventilation position in which a front edge of the cover lies at a distance below a plane at the height of the roof skin, while the cover rear edge is kept approximately at the height of the fixed roof skin, and where the rear edge of the cover can then be lowered, so that the cover can be slid to the rear by a drive along longitudinal guide mechanisms that are fixed with the roof, approximately parallel to the fixed roof skin, underneath the roof skin, into an open position in which the cover at least partially opens the roof opening, the improvement wherein a sliding inside roof headliner is coupled by a catch device to the drive via a detachable coupling, so that the sliding inside roof headliner, in its closed position, is automatically pushed back during swinging of the cover from the closed position into the ventilation position, as a means for creating a ventilation gap in front of the sliding inside roof headliner; wherein said drive comprises drive cables and components fixedly connected with the drive cables, and wherein the catch device comprises a catch that is driven by a respective one of the cables; wherein said detachable coupling is provided as a means for automatically coupling the drive with a glide part for swinging a push-out lever and for sliding the cover, and wherein the catch is connected to a part of the detachable coupling, said part of the detachable coupling being fixed to the drive cable.

5,069,501

SPOILER SUNROOF CONTROL MECHANISM

David P. Baldwin, Romeo, Mich.; Stephanus F. Du Toit, Pretoria, South Africa, and Jose A. Mirkin, West Bloomfield, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 3, 1990, Ser. No. 562,086

Int. Cl.[5] B60J *7/047*

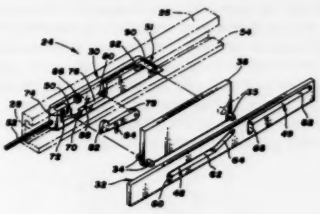
U.S. Cl. 296—223 **4 Claims**

4. A control assembly for moving a closure panel for an opening in a roof of a vehicle between a first position in which an opening of the roof is closed and a second position in which the panel is displaced from the opening, said control assembly comprising:

drive means moveable between predetermined positions and having means defining a pair of longitudinally spaced apart drive cam surfaces;

orientating means for guiding said panel during movement between said positions and including means defining a pair longitudinally spaced apart orientating cam surfaces; and

said panel including a control arm having first and second cam following means fixedly secured thereon in longitudinally spaced relationship with respect to each other, said cam following means being slidably moveable along said orientating cam surfaces and slidably moveable along said



drive cam surfaces such that movement of said drive means relative to said orientating means moves said closure panel between said first and second positions.

5,069,502

SUNROOF DRIVING APPARATUS

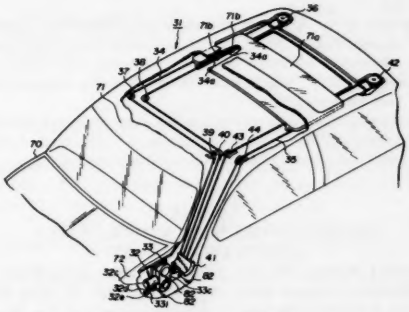
Shuji Sekine; Takeo Furuya, and Tetsuya Obara, all of Yokohama, Japan, assignors to Jidosha Denki Kogyo K.K., Kanagawa, Japan

Filed Jul. 9, 1990, Ser. No. 549,837

Claims priority, application Japan, Jul. 10, 1989, 1-81087[U]; Sep. 5, 1989, 1-104225[U]

Int. Cl.[5] B60J *7/057*

U.S. Cl. 296—223 **3 Claims**



1. A sunroof driving apparatus comprising:

a motor unit disposed away from a roof of a motor vehicle and having a motor shaft rotatable in forward and reverse directions according to electric power supply; and

an output unit disposed away from the roof and united with said motor unit as one body, said output unit having a pair of rotatable worm wheels operatively connected to a sunroof lid and said motor shaft having a worm gear thereon disposed between said worm wheels in meshing engagement therewith for converting rotation of said motor shaft into opening and closing movements of said sunroof lid.

5,069,503

PORTABLE, COLLAPSIBLE MULTI-PURPOSE CHAIR

Juan J. Martinez, 555 Cumberland, San Antonio, Tex. 78204

Filed May 9, 1990, Ser. No. 521,027

Int. Cl.[5] A47C *4/00*

U.S. Cl. 297—54 **16 Claims**

1. A portable chair comprising:

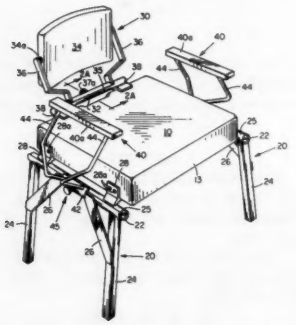
a quadrilateral seat having rigid peripheral front, side and rear frame elements;

a pair of arm rests, each arm rest having a depending U-shaped frame structure having a horizontal base portion;

means for horizontally pivotally securing said horizontal base portion of said U-shaped frame respectively to said side frame elements for movement between collapsed positions adjacent said seat and elevated positions respectively above each said side element of said seat;

a back rest having a back engaging element mounted on a rigid frame structure including a rigid bottom element;

means for horizontally pivotally securing said rigid bottom element of said back rest to said rear frame element of said seat for movement of said back rest between a collapsed horizontal position adjacent said seat and an upwardly and rearwardly inclined position relative to said seat;



a horizontal support rod secured to each side frame element of said seat in spaced, parallel relationship;

a pair of leg frames;

tubular means on the top of each said leg frame for pivotally engaging said support rod for movement of each leg frame between a collapsed position underlying said seat to a substantially vertical position to vertically support said seat thereon; and

manually releasable means for securing each said tubular means against movement relative to the respective support rod in said substantially vertical position.

5,069,504

CHAISE LOUNGE WITH MOTOR-DRIVEN ADJUSTABLE CANOPY

Gerald J. Felling, 230 Arroyo Rd., Langunitas, Calif. 94938

Continuation-in-part of Ser. No. 496,520, Mar. 20, 1990, Pat. No. 5,015,032, which is a continuation-in-part of Ser. No. 482,190, Feb. 20, 1990, which is a continuation-in-part of Ser. No. 385,057, Jul. 26, 1989, abandoned. This application Dec. 14, 1990, Ser. No. 628,486

The portion of the term of this patent subsequent to May 14, 2008, has been disclaimed.

Int. Cl.[5] A47C *7/62*

U.S. Cl. 297—184 **15 Claims**

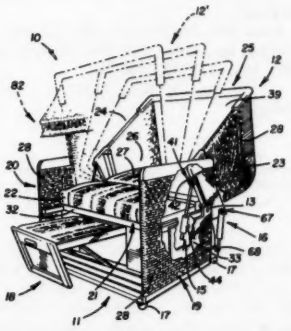
1. A sheltering lounge chair usable for sun bathing and the like comprising

a base frame having laterally spaced and vertically disposed sides and a horizontally disposed top adapted to retain a seating cushion thereon,

a normally upright canopy frame having laterally spaced and vertically disposed sides, a top and a normally upright back all secured together to form a hood open on its frontal side,

pivot means for pivotally mounting a rearward end of said base frame for permitting said canopy frame to be moved through an infinite number of positions between its normal upright position to form a seating arrangement and a fully lowered position placing the back of said canopy frame in at least general horizontal alignment with the top of said base frame to form a bed, and

combined moving, holding and locking means for selectively releasing and moving said canopy to a selected position and for holding and locking said canopy frame in said selected position between its upright and fully lowered positions, including a reversible electric motor secured on said base frame and actuating means connected



to said motor and pivotally interconnected between said base frame and said canopy frame for selectively pivoting said canopy frame on said base frame in response to activation of said motor.

5,069,505

VEHICLE SEAT, ESPECIALLY AN AIR PASSENGER SEAT

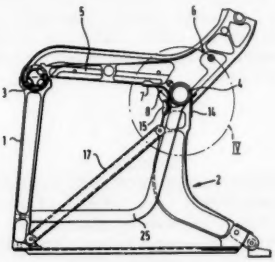
Thomas Amthor, Rosengarten-Westheim; Erwin Neumann, Schwäbisch Hall; Wolfgang von Rolbicki, Geschlachtenbretzingen, and Frank Starke, Schwäbisch Hall, all of Fed. Rep. of Germany, assignors to Keiper Recaro GmbH & Co., Fed. Rep. of Germany

Filed Jun. 6, 1990, Ser. No. 533,845

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1989, 3918500

Int. Cl.[5] B64D *25/04*

U.S. Cl. 297—216 **20 Claims**



1. A vehicle seat, especially an air passenger seat, comprising a front foot and a rear foot, at least on one side, which can be connected to the vehicle floor in the area of their lower end, and which are connected to one another in the area of their upper end, by means of a longitudinal strut, which extends upward at a slant beyond the connecting point with the rear foot, such that the connection between the front foot and the longitudinal strut prevents rotation about an axis that runs in the direction transverse to the seat, and further including:

a) rotary means for connecting the rear foot and the longitudinal strut which permits motion about an axis that runs in the direction transverse to the seat; wherein

b) the rear foot is curved in a middle section between an upper and lower end region in the direction of the front foot, has a U-shaped profile that is open towards the side and has a rear leg, a front leg and a webbed zone between said legs, whereby in the event of a crash the middle

section is bent outwardly in the area of the front leg and the adjoining webbed zone.

5,069,506

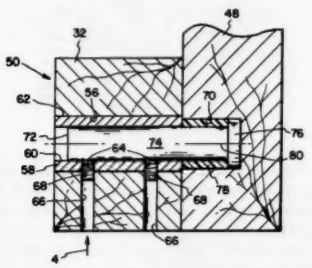
KNOCK-DOWN FURNITURE ASSEMBLY

Roy M. Wieland, Bay City, Mich., assignor to R. M. Wieland Company, Kawkawlin, Mich.

Continuation-in-part of Ser. No. 499,812, Jun. 1, 1983, abandoned. This application Sep. 11, 1987, Ser. No. 95,767

Int. Cl.[5] A47C *7/00*

U.S. Cl. 297—440 **20 Claims**



1. In an article of furniture having selected components which are adapted to be disassembled and reassembled in a given direction, a joint providing for such disassembly and reassembly between said selected components comprising two axially mutually separable slip fitting elements, one said elements being affixed to one of said selected components and another said element being affixed to another of said selected components, said elements being arranged with their axial slip fit in the same direction as said selected components are adapted to be disassembled, and means for releasably locking said elements when they are mutually slip fitted, said locking means comprising set screw means threadably engaged with a transverse threaded bore of said one element and selectively operable transversely of the direction of slip fit to one position for transversely directly contacting and forcefully bearing against said another element and forcing said another element against said one element thereby to lock said elements against axial separation and to another position permitting said elements to axially separate, one of said selected components having a bore aligned with and forming a continuation of said transverse threaded bore of said one element, said set screw means extending into the end of said continuation bore adjacent said one element and being non-protruding from the opposite end of said continuation bore of said one selected component when said set screw transversely forcefully contacts said another element.

5,069,507

DUMPING TRAILER

Vurness T. Lindsey, 6327 Egret Ct., Ventura, Calif. 93003

Filed Oct. 22, 1990, Ser. No. 600,684

Int. Cl.[5] B60P *1/02, 1/34*

U.S. Cl. 298—11 **4 Claims**

1. A dumping trailer comprising:

a wheel assembly resting on a supporting surface facilitating movement of said dumping trailer on said supporting surface;

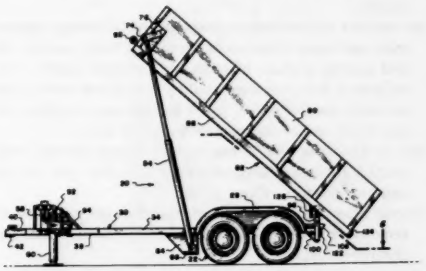
a bed frame, said wheel assembly being mounted on said bed frame;

a box frame mounted on said bed frame, said box frame to include a cargo carrying surface, said box frame having a rear end and a fore end;

a pivoting linkage connecting said box frame and said bed frame, said pivoting linkage being located adjacent said rear end, said pivoting linkage permitting movement of said box frame between a lower position and a raised position, said lower position being when said box frame is in juxtaposition with said bed frame, said raised position being when said box frame is spaced from said bed frame and located a greater distance from said supporting surface than when said box frame is in said lower position;

an actuator assembly connected between said box frame and said bed frame, said actuator assembly to be activatable to produce movement of said box frame from said lower position to said raised position;

a track assembly mounted on said bed frame, a roller assembly mounted on said box frame, said roller assembly to



move on said track assembly as said box frame moves from said lower position to said raised position, said track assembly to be located directly adjacent said fore end, said track assembly causes said box frame to remain parallel to said bed frame as said box frame moves between said lower position and said raised position; and

said box frame to be movable to an inclined position from said raised position, said inclined position being when said box frame is located at an inclined angle relative to said bed frame.

5,069,508

BRAKE HYDRAULIC PRESSURE CONTROL APPARATUS

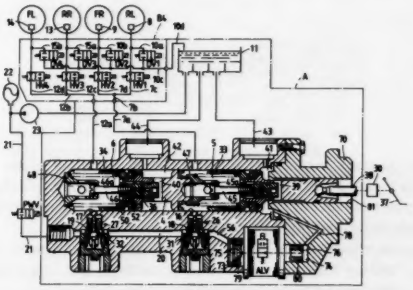
Toshifumi Maehara, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo and Akebono Research and Development Centre Ltd., Saitama, both of, Japan

Filed Jan. 17, 1990, Ser. No. 466,636

Claims priority, application Japan, Jan. 18, 1989, 1-7746

Int. Cl.[5] B60T *8/06*

U.S. Cl. 303—113 TR **14 Claims**



1. A brake hydraulic pressure control apparatus providing anti-lock control for preventing the locking of vehicle wheels during braking and providing traction control to prevent slipping of the vehicle wheels during starting or accelerating of the vehicle, the apparatus comprising:

a master cylinder assembly including a body portion, an adaptor portion removably attached to an end of said body portion and a reservoir;

a hydraulic passage disposed within said adaptor portion;

hydraulic passages disposed within said master cylinder assembly;

a distributor assembly removably attached to said master cylinder assembly, said distributor assembly including a predetermined number of control channel means for controlling the vehicle wheels, a predetermined number of hydraulic passages, and a predetermined number of electromagnetic valves corresponding to the predetermined number of control channel means, said electromagnetic valves being disposed in said hydraulic passages for performing said anti-lock and traction control on said vehicle wheels;

an anti-lock control electromagnetic valve having opposed ends and being disposed between said body portion and said adaptor portion, wherein said anti-lock control valve includes a first port supported by one of said ends of said anti-lock control valve, and a second port supported by said other end of said anti-lock control valve;

first receiving means formed in said master cylinder body portion for removably receiving said first port of said anti-lock control valve;

second receiving means formed in said adaptor portion for removably receiving said second port of said anti-lock control valve; and

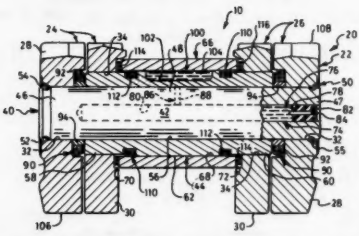
connecting means for connecting the hydraulic passages of said master cylinder assembly with said hydraulic passages of said distributor assembly when said master cylinder assembly and said distributor assembly are assembled.

5,069,509

ENDLESS TRACK CHAIN WITH ROTATABLE SLEEVE

Mark L. Johnson, Peoria, and Thomas E. Oertley, Dunlap, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jun. 18, 1990, Ser. No. 540,042
Int. Cl.[5] B62D *55/092, 55/21*
U.S. Cl. 305—58 PC **25 Claims**



1. A track hinge joint for articulately, coupling a pair of outboard link ends of a one set of links of an endless track chain to a pair of inboard link ends of an adjoining set of links of said track chain, said joint comprising:

a pin non-rotatably secured to said outboard link ends;

a bushing rotatably received about said pin and non-rotatably secured to said inboard link ends;

a cylindrical sleeve rotatably mounted about said bushing;

first means for sealing and lubricating said joint, said first lubricating means having a first supply of lubricant and for supplying said lubricant between the pin and bushing; and

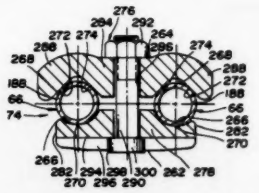
second means for sealing and lubricating said joint, said second lubricating means having a second supply of lubricant for supplying said lubricant between the bushing and sleeve, said second lubricant supply being separate from said first lubricant supply.

5,069,510

CENTER CONNECTOR FOR SHOE ASSEMBLIES OF TRACK LAYING VEHICLE

Robert M. Cory, Roseville, Mich., assignor to General Dynamics Land Systems, Inc., Warren, Mich.

Division of Ser. No. 752,186, Jul. 3, 1985, Pat. No. 4,700,992.
This application Apr. 7, 1987, Ser. No. 35,644
Int. Cl.[5] B62D *55/205*
U.S. Cl. 305—58 PC **8 Claims**



1. In an endless track for a track laying vehicle, said endless track being of the type including a plurality of shoe assemblies each of which includes a pair of laterally spaced shoes and a pair of round pins extending therebetween, a center connector for connecting adjacent shoe assemblies by extending between adjacent pins thereof at a location between the laterally spaced shoes, said center connector comprising: a pair of clamp members including two pairs of opposed clamping surfaces; one clamping surface of each pair including one location for engaging the associated pin with line contact that constitutes the sole engagement thereof with the pin; the other clamping surface of each pair including two spaced locations for engaging the associated pin with two spaced line contacts that constitute the only engagement thereof with the pin; a connection for securing the clamp members to each other with each pair of clamping surfaces thereof engaging each pin at the three locations of line contact which form a triangular shape; each clamp member including a central connection hole and a pair of clamping flanges extending in opposite directions from the central connection hole; one pair of clamping flanges each being provided with one of the locations for engaging the associated pin with line contact; the other pair of clamping flanges each being provided with the other two locations for engaging the associated pin with line contact; the connection including a threaded bolt that extends through the central connection holes of both clamp members between the pins connected thereby; the connection also including a nut that is threaded onto the bolt thereof to secure the clamp members to each other with each pair of clamping flanges engaging the associated pin at three spaced locations of line contact; one clamp member including a longitudinal groove extending between the clamping flanges thereof and having at least one side surface; and the bolt of the connection having a head that is received within the groove and has at least one flat surface positioned by said one side surface of the longitudinal groove to permit tightening of the nut for securing the clamp members to each other.

5,069,511

PHARMACEUTICAL CABINET LOCKING ARRANGEMENT

Mark D. Swets, Grand Rapids; George A. Williams, Hudsonville, and Steven F. Goodman, Wyoming, all of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed May 10, 1990, Ser. No. 521,640
Int. Cl.[5] A47B *87/00*
U.S. Cl. 312—107.5 **17 Claims**

1. A pharmaceutical cabinet comprising:

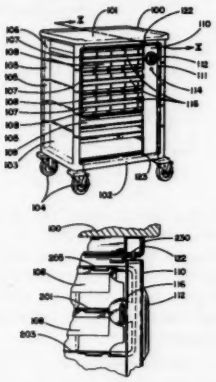
a pair of side walls in spaced-apart relationship;

a pair of upper and lower spaced-apart substantially parallel shelves mounted between and to said side walls, each of said shelves having a front edge;

a plurality of dispensing bins supported on each of said

shelves in a side-by-side relation and removable by sliding said bins in a direction substantially perpendicular to said front edge; and

a first locking bar mounted to said side walls and disposed frontally to a lower portion of each of said bins supported on said upper shelf and an upper portion of each of said bins supported on said lower shelf and having an elongated cross section, said first locking bar rotatable about an axis of rotation extending in a direction substantially parallel to said front edges to a releasing position wherein



a longer dimension of said elongated cross section extends in a direction parallel to said direction of sliding of said bins for allowing sliding removal of bins supported on said upper shelf and on said lower shelf and rotatable about said axis to a locking position wherein said longer dimension extends in a direction perpendicular to said direction of sliding of said bins for restraining removal of said bins supported on said upper shelf and said lower shelf; and

means to selectively maintain said first locking bar in said locking position to selectively lock said bins within said side walls.

5,069,512

DISPLAY CABINETS

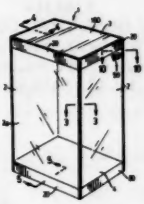
Christopher C. Sykes, Toronto, Canada, assignor to Click Systems Limited, Mississauga, Canada

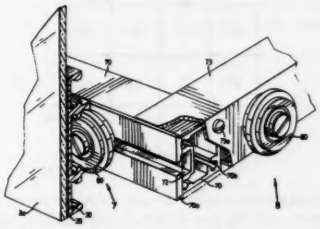
Filed Apr. 28, 1989, Ser. No. 344,607

Int. Cl.[5] E06B *00/00*

U.S. Cl. 312—139.2 **15 Claims**

1. A cabinet having sides and an opening at the front, a glass panel, and movable linkage means connecting between the sides of the cabinet and the glass panel for movement of the panel between a position closing the opening and a position revealing the opening, said linkage means including a rigid metal planar element bonded on the inner side of the glass panel with a double sided adhesive tape comprising a resiliently compressible core and a pressure sensitive adhesive





coating on each face and providing sufficient strength to support the weight of the glass panel.

5,069,513

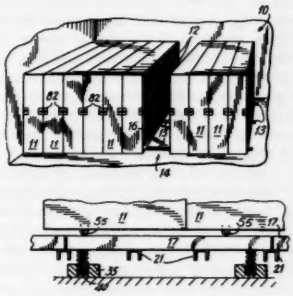
MOBILE SHELVING SAFETY FLOOR

Richard B. Farrell, New York, and James H. Rogers, Middle Village, both of N.Y., assignors to Automated Storage & Retrieval Systems of America, New York, N.Y.

Filed Sep. 27, 1990, Ser. No. 589,322

Int. Cl.[5] A47B *53/00*

U.S. Cl. 312—201 **13 Claims**



1. A mobile shelving system comprising:

(a) plural carriages having storage means,

(b) means for selectively moving the carriages toward and away from each other to selectively form access aisles between adjacent carriages,

(c) a floor beneath the plural carriages for supporting a user when accessing the storage means on a carriage adjacent an open aisle,

(d) means for supporting said floor so as to be movable when a user steps on the floor when entering an open aisle,

(e) drive means connected to the carriage moving means for operating the moving means when activated,

(f) switch means connected to the drive means for disabling the drive means when any of the switch means is triggered, each of said switch means being mounted on a carriage and being activated in response to movement of said floor when a user steps on the floor to trigger the switch means and thereby disable the moving means to

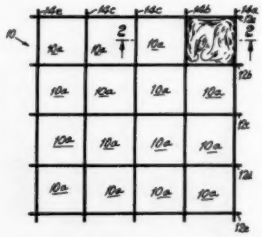
prevent inadvertent closing of the aisle while a user is present in the aisle.

5,069,514

PANTY HOSE STORAGE DEVICE

Laura Sherman, 33 W. 81st St., New York, N.Y. 10024

Filed Mar. 4, 1991, Ser. No. 663,470
Int. Cl.[5] A47B *88/00*
U.S. Cl. 312—348.3 **2 Claims**



1. In a panty hose storage device, a first group of flat partition members, said first group of partition members being made from a fabric that has been treated with a fabric stiffener, each partition member in said first group of partition members being identical to every other partition member in said first group of partition members, each partition member in said first group of partition members having a number of downwardly extending vertical cuts spaced along the length of each partition member, the number of said vertical cuts in each partition member being equal to the number of partition members in said first group of partition members, a second group of partition members equal in number to the partition members in said first group, said second group of partition members being made from a fabric that has been treated with a fabric stiffener, and second group of partition members each being identical to every other partition member in the second group of partition members and each including an upwardly extending vertical cut extending from the lower edge thereof with the number of vertical cuts in each partition member of the second group of partition members being equal to the number of partition members in said second group, each vertical cut in a partition member of one group of partition members cooperating with a vertical cut in a partition member of the other group of partition members so as to secure the first group of partition members to the second group of partition members and vice versa, and means for securing a portion of each partition member in the first group of partition members to a partition member in the second group of partition members and vice versa to define a plurality of panty hose compartments, compressed panty hose stored in at least some of said compartments, whereby said panty hose storage device can be placed on a dresser drawer shelf.

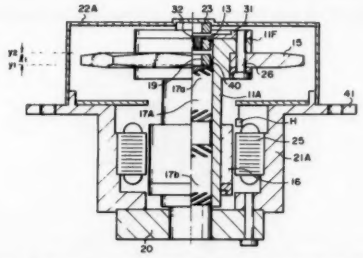
5,069,515

OPTICAL DEFLECTOR OF AIR BEARING TYPE

Yukio Itami, Yokohama; Mitsuo Suzuki, Kita; Teruo Ohne, Omiya; Kenichi Hoshi, Yokohama; Eiri Sagae, Atsugi, and Yoshio Hashimoto, Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 19, 1990, Ser. No. 584,615
Claims priority, application Japan, Sep. 22, 1989, 1-245239; Nov. 20, 1989, 1-299660; Jun. 26, 1990, 2-165577
Int. Cl.[5] G02B *26/08*
U.S. Cl. 359—200 **13 Claims**

1. An optical deflector of an air bearing type comprising:
a fixed shaft;
a rotary shaft having a hollow portion fitted onto the fixed shaft;
support means disposed between an end portion of the fixed shaft and an end portion of the hollow portion opposite thereto and supporting the rotary shaft in an axial direction thereof;
a radial air bearing formed between an inner circumferential face of the hollow portion and an outer circumferential face of the fixed shaft;
a polygon mirror fixed to the rotary shaft;
driving means for rotating the rotary shaft;



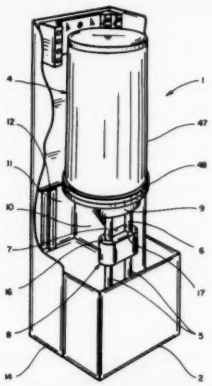
means for deflecting light irradiated onto the polygon mirror by rotating the rotary shaft through the driving means;
means for forming a flange for fixing the polygon mirror thereto integrally with the rotary shaft; and
means for setting an upper end portion of the support means on a fixed shaft side thereof to be lower than an upper end face of the polygon mirror.

5,069,516

TELECOMMUNICATIONS CLOSURES

Lowell I. Kohy, Foster City, and Damian Kaczorowski, San Mateo, both of Calif., assignors to Raynet Corporation, Menlo Park, Calif.

Filed Nov. 21, 1989, Ser. No. 439,410
Int. Cl.[5] H02G *9/00;* **G02B** *6/00*
U.S. Cl. 350—96.1 **8 Claims**



1. A pedestal enclosure for sealing a telecommunication cable, comprising:
a closure for sealingly enclosing a portion of a telecommunication cable;
a pedestal surrounding the closure and having a bottom surface in contact with a ground surface, the pedestal including means for supporting the closure therein so as to allow the closure to be passively slideable along a vertical direction relative to the pedestal and the ground surface;
the supporting means comprising a bracket fixably attached to the closure, and rail and channel means connectable to

the bracket which allow the bracket to slide along the vertical direction relative to the pedestal.

5,069,517

INTEGRATED OPTICAL WAVEGUIDE

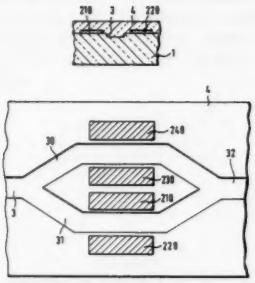
Peter Kersten, Leonberg, and Helmut Hanisch, Nürtingen, both of Fed. Rep. of Germany, assignors to Alcatel N.V., Amsterdam, Netherlands

Filed Sep. 5, 1990, Ser. No. 578,092

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1989, 3929410

Int. Cl.[5] G02B *6/10*

U.S. Cl. 385—130 **8 Claims**



1. A method of manufacturing an optical waveguide integrated on a transparent substrate and having electrodes along sides of said waveguide, comprising the steps of:

covering the upper surface of the substrate with a metal layer;

etching away parts of the metal layer to form metallic stripes;

etching the substrate in the area between the stripes to form a groove;

etching the metallic stripes to form areas constituting the electrodes; and

filling the groove, at least up to the level of the surface of said areas constituting the electrodes, with a material which exhibits an electrooptical effect and forms the optical waveguide.

5,069,518

METHOD OF FABRICATING A FIBER OPTIC COUPLER

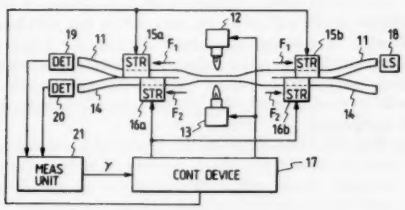
Hiroyuki Sasaki, Tokyo, Japan, assignor to Japan Aviation Electronics Industry Limited, Tokyo, Japan

Filed Jul. 9, 1990, Ser. No. 550,079

Claims priority, application Japan, Jul. 31, 1989, 1-200095

Int. Cl.[5] G02B *6/26*

U.S. Cl. 385—43 **4 Claims**



1. A method of fabricating a fiber optic coupler, comprising the steps of;

fusing together at least two optical fibers along their longitudinal sections by heating; and

stretching said fused optical fibers independently of one another with different conditions so that the difference in their propagation constants varies.

5,069,519

OPTICAL FIBRE HANDLING APPARATUS AND METHOD OF USING SAME

Simon M. James, Woodbridge; Roland W. Downing, and Dominik Drouet, both of Ipswich, all of England, assignors to British Telecommunications public limited company, London, England

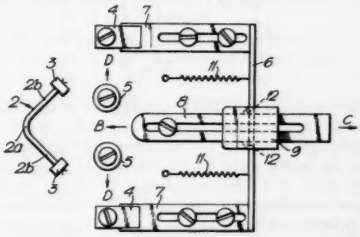
PCT No. PCT/GB89/00024, § 371 Date Jul. 16, 1990, § 102(e) Date Jul. 16, 1990, PCT Pub. No. WO89/06815, PCT Pub. Date Jul. 27, 1989

PCT Filed Jan. 12, 1989, Ser. No. 543,754

Claims priority, application United Kingdom, Jan. 13, 1988, 8800666

Int. Cl.[5] G02B *6/26*; H01J *5/16*

U.S. Cl. 385—32 **22 Claims**



1. Apparatus for handling an optical fibre, the apparatus comprising a casing defining a substantially light-proof enclosure surrounding an optical fibre operating position defined by a secondary waveguide, and mechanical means for picking up an optical fibre and transporting that optical fibre to the operating position, wherein the secondary waveguide defines a curved optical waveguiding path, and the mechanical means is such as to position the optical fibre in a curved position which at least substantially conforms to the inner side of the curved optical waveguiding path, whereby optical energy passing along the optical fibre is tapped into the curved optical waveguiding path.

21. A method of measuring optical energy from an optical fibre comprising the steps of:

bending the optical fibre into position adjacent a curved secondary waveguide,

applying optical energy to the optical fibre,

tapping optical energy out of said curved waveguide into the secondary waveguide,

guiding the optical energy tapped from the fibre along the curved path defined by the secondary waveguide, and

measuring optical energy tapped from the optical fibre to the secondary waveguide.

5,069,520

HIGH-SPEED MODULATOR OF THE POLARIZATION OF AN OPTICAL CARRIER

Riccardo Calvani, Pino Torinese; Renato Caponi, and Giuseppe Marone, both of Turin, all of Italy, assignors to Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Jan. 19, 1990, Ser. No. 467,656

Claims priority, application Italy, Mar. 28, 1989, 67214 A/89

Int. Cl.[5] G02B *6/26*

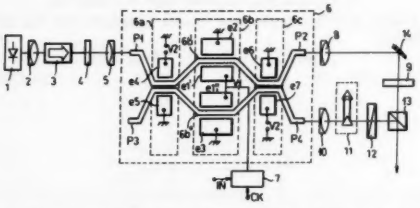
U.S. Cl. 385—1 **18 Claims**

1. A polarization modulator for a digital signal transmission system in which a digital data signal (IN) having a plurality of logic levels modulates a state of polarization of an optical carrier, said modulator comprising:

an integrated optical waveguide device having at least one input port receiving a linearly-polarized input radiation

constituting an optical carrier to be modulated, two output ports, and means controlled by said data signal for sharing optical power of the input radiation between a first radiation and a second radiation outgoing at said output ports respectively, power fraction associated with each of said first and second radiations depending on a logic level of the data signal, the radiations outgoing from said output ports being sent along a first path and a second path, respectively;

means for rotating by 90° the polarization plane of the radiation present on one of said paths; and



means responsive to a state of polarization of the radiations present on said paths for receiving at a first and a second input respectively for the radiations coming from the first and the second paths and for transferring radiations from said paths to a modulator output to form a modulated signal consisting of an output radiation presenting a state of polarization depending on a power fraction associated with the radiation sent along the respective path and hence on the level of the data signal.

5,069,521

OPTICAL TRANSMISSION APPARATUS

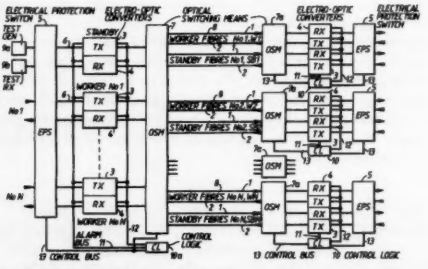
David W. Hardwick, Nottingham, England, assignor to GEC Plessey Telecommunications Limited, Coventry, United Kingdom

Filed May 7, 1990, Ser. No. 519,217

Claims priority, application United Kingdom, May 12, 1989, 8910957

Int. Cl.[5] G02B *6/28*

U.S. Cl. 385—24 **2 Claims**



1. Optical transmission apparatus comprising:

a plurality of worker optical fibre transmission paths;

a plurality of standby optical fibre transmission paths;

a plurality of transmit and receive electro-optic converters connected to terminate both ends of respective ones of said plurality of worker and standby optical fibre-transmission paths;

electrical protection switching means connected to and interfacing with said plurality of transmit and receive electro-optic converters at both ends of said worker and standby optical fibre transmission paths for switching optical transmission between the worker and standby optical fibre transmission paths when a fault is detected in a transmission path;

a single standby electro optic converter;

optical switching means arranged to interface said worker transmission paths and said standby transmission paths with said plurality of transmit and receive electro-optic converters and said single standby electro-optic converter; and

microprocessor based control logic means coupled to said plurality of transmit and receive electro-optic converters and said standby electro-optic converter by an alarm bus, and to each electrical protection switch means and said optical switching means by a control bus, said microprocessor monitoring alarm indications on the alarm bus and taking action based upon alarm indications to instruct the electrical protection switching means and the optical switching means to operate when a fault is identified thereby setting up an alternative transmission path.

5,069,522

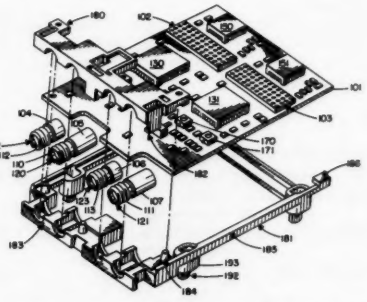
OPTICAL FIBER LINK CARD

Timothy R. Block; Marcia B. Ebler; Ladd W. Freitag; Gerald M. Heiling; Spencer C. Holter; Dennis L. Karst; David W. Siljenberg; Ronald L. Soderstrom, and John T. Trnka, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 462,681, Jan. 9, 1990, Pat. No. 5,039,194. This application Mar. 19, 1991, Ser. No. 672,193

Int. Cl.[5] G02B *6/36*

U.S. Cl. 385—39 **17 Claims**



1. An optical communication module, including a single multilayer double surface mount optical fiber link card having a plurality of converters mounted thereon, for converting between parallel electrical signals and serial optical signals, wherein said optical signals are transmitted and received by the module over at least one full duplex optical communication link, comprising:

(a) first optical assembly means, electrically coupled to at least one of said plurality of converters, including at least one axial leaded optical transmitter that is optically coupled to said communication link; and

(b) retainer means, for holding said first optical assembly in proximity to an edge of said card so as to align said at least one optical transmitter to said edge and facilitate attaching the leads of said at least one optical transmitter to the surface of said card.

5,069,523

CASSETTE FOR SPARE LENGTHS OF LIGHT WAVEGUIDES TO BE USED AT THE SITE TO BE SPLICED

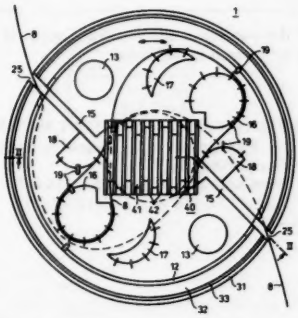
Lothar Finzel; Monika Kreuz, both of Munich, and Ernst Bachel, Geltendorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 28, 1989, Ser. No. 442,257

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1988, 3841607

Int. Cl.[5] G02B *6/36*

U.S. Cl. 385—135 **19 Claims**



19. A cassette for holding excess lengths of light waveguides in a splice area comprising:

a cover part;

a pot-shaped bottom part having a bottom disk and a rim extending perpendicular thereto, said cover and bottom parts superposed to jointly enclose an area forming a magazine for excess lengths of the light waveguides, said cover part being rotatable in said bottom part;

two approximately radially directed guide slots formed in said cover part;

guide members disposed on said cover part; and

a splice holder mounted on said cover part to form a rotatable splice holder.

5,069,524

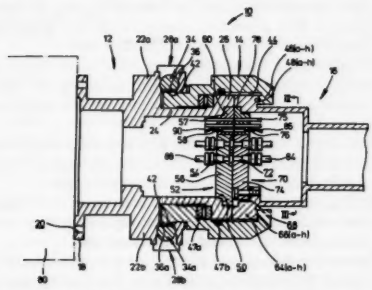
ROBOT HAND OPTICAL FIBER CONNECTOR COUPLING ASSEMBLY

Shinpei Watanabe; Yasuto Watanabe; Yuzi Ikeda; Keiichiro Gunji, and Ryo Niikawa, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 165,029, Mar. 7, 1988, Pat. No. 4,990,022. This application Aug. 28, 1990, Ser. No. 573,864

Int. Cl.[5] G02B *6/38*; H01J *5/16*; B25J *19/00*

U.S. Cl. 385—59 **9 Claims**



1. A robot hand changer comprising:

a first joint member adapted to be mounted on a robot arm;

a second joint member adapted to be mounted on a robot hand, said first and second joint members being detachably coupled to connect said robot hand to said robot arm;

a plurality of optical signal transmitting means mounted in said first and second joint members, each optical signal transmitting means comprising a pair of optical elements in confronting relation out of contact with each other, for transmitting a plurality of control signals across mating surfaces of said robot hand and said robot arm; and

photoelectric transducer circuits adapted to be disposed in said robot hand and said robot arm, respectively, for converting an optical signal received via said optical signal transmitting means to electric signals and/or converting an optical signal transmitted via said optical signal transmitting means from electric signals.

5,069,525

OPTICAL FIBER BUILT-IN TYPE COMPOSITE INSULATOR AND METHOD OF PRODUCING THE SAME

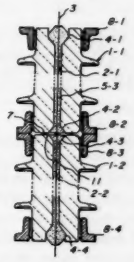
Shoji Seike, Nagoya; Koichi Mori, Handa; Mitsuji Ikeda, Nagoya; Masayuki Nozaki, Aichi; Hisakazu Okajima, Nagoya; Hiroyuki Katsukawa, Aichi; Kazumi Nakanishi, Inuyama, and Kenji Doi, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Oct. 16, 1989, Ser. No. 421,848

Claims priority, application Japan, Oct. 14, 1988, 63-257366; Oct. 14, 1988, 63-257367; Mar. 23, 1989, 1-71332; Mar. 23, 1989, 1-71333; Mar. 24, 1989, 1-73621

Int. Cl.[5] G02B *6/44*

U.S. Cl. 385—100 **14 Claims**



12. An optical fiber built-in type composite insulator, comprising:

at least two joined insulator bodies each having a penetration bore in a central axis portion thereof, said insulator bodies being stacked such that each said penetration bore is aligned;

at least one optical fiber inserted in each said penetration bore;

at least one space formed between opposing end surfaces of the insulator bodies for serving as at least one joining portion, each joining portion receiving an extended portion of the optical fiber extending from each said penetration bore, the extended portion of the optical fiber being joined at opposing end surfaces thereof in the joining portion;

a gelatinous, foamy or rubbery sealing material filled in each said penetration bore for fixing the optical fiber, the optical fiber being guided spirally in the joining portion by the sealing material; and

a connector metallic fitting having a perforation and being fixed on outer peripheral surfaces of opposing end portions of the insulator bodies by fixing opposing surfaces of flanges of the connector metallic fitting such that the opposing surfaces of the flanges of the connector metallic fitting protrude from the opposing end surfaces of the insulator bodies, wherein the connector metallic fitting

and the insulator bodies define the joining portion such that the space of the joining portion has a radius larger than a minimum bending radius of the optical fiber and assures accommodation of the optical fiber therein.

5,069,526

EARTH-WIRE OVERHEAD CABLE

Ulrich Oestreich, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

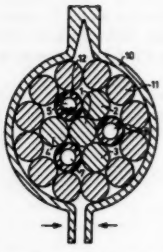
PCT No. PCT/DE88/00747, § 371 Date Aug. 6, 1990, § 102(e) Date Aug. 6, 1990, PCT Pub. No. WO89/06039, PCT Pub. Date Jun. 29, 1989

PCT Filed Dec. 1, 1988, Ser. No. 477,939

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1987, 3742925

Int. Cl.[5] G02B *6/44*

U.S. Cl. 385—101 **2 Claims**



1. An earth-wire overhead cable having integrated optical transmission elements and including several stranded elements, of which at least one contains an optical transmission element, the cable comprising:

a central steel wire;

at least one layer comprising a plurality of lines stranded onto the central wire, wherein one of said plurality of lines comprises an optical transmission element contained in a protective casing, and those of said plurality of lines not being optical transmission elements comprising steel wires, the central steel wire and said layer of steel wires and optical transmission elements stranded thereon forming a stranded core; and

at least one layer of stranded elements configured onto said stranded core, the stranded elements being formed of a hard aluminum or of an aluminum alloy with conducting properties.

5,069,527

APPARATUS FOR MEASURING THE MODE QUALITY OF A LASER BEAM

Thomas F. Johnston, Jr., Auburn, and David A. Dewey, Sunnyvale, both of Calif., assignors to Coherent, Inc., Palo Alto, Calif.

Filed Apr. 26, 1990, Ser. No. 511,817

Int. Cl.[5] G02B *7/02*

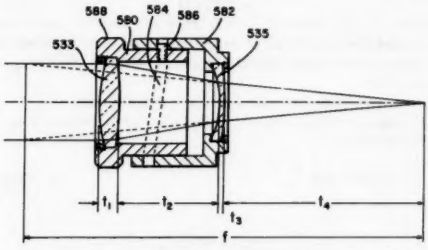
U.S. Cl. 359—823 **7 Claims**

1. An adjustable lens system for selectively focusing laser light over a broad wavelength range comprising:

a first lens having a spherical aberration;

a second lens, spaced from said first lens and having a shape selected to compensate for said spherical aberration of the first lens at a given spacing for a given wavelength within said range; and

means for adjusting the spacing between sad lenses, with the spacing being selected to minimize a net spherical aberration of the two lenses for any wavelength of said laser light to be focused in said range.



5,069,528

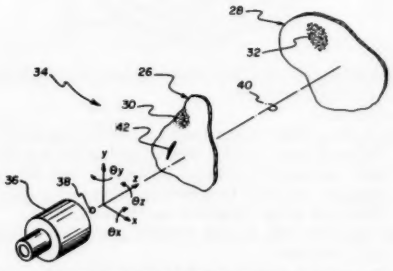
REMOTE OPTICAL ALIGNMENT METHOD

Thomas W. Dey, Springwater, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 26, 1990, Ser. No. 516,013

Int. Cl.[5] G02B *26/02*; G01B *11/00*

U.S. Cl. 359—233 **2 Claims**



1. A method for uniquely aligning remote first and second objects, comprising

a pre-alignment stage, the pre-alignment stage comprising the two steps of

(1) generating a first geometric configuration on a first object, the first geometric configuration comprising dark and clear regions having at least one portion characterized by a first random geometric configuration; and,

(2) generating on a second object a geometric configuration which is a geometric complement of a projection of the first random geometric configuration, as generated from a remote viewing location;

and an alignment stage comprising the steps of:

(3) placing the first and the second objects along a common optical axis from the remote viewing location so that the first geometric configuration and its projected complement generate a unique dark spot;

(4) transversely translating at least one of the first and the second objects in a direction orthogonal to the common optical axis, for centering the dark spot on the common optical axis;

(5) tilting at least one of the first and the second objects toward or away from the common optical axis for maximizing the circularity of the dark spot;

(6) longitudinally translating at least one of the first and the second objects in a direction along the common optical axis for expanding the dark spot;

(7) rotating at least one of the first and the second objects about the common optical axis, for further expanding the dark spot; and

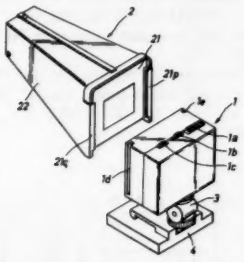
(8) repeating steps 4 through 7 until the dark spot substantially fills the portion of the first geometric configuration characterized by randomness.

5,069,529

PORTABLE DISPLAY EQUIPMENT

Kotaro Takahashi, Kiyose, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed May 4, 1990, Ser. No. 519,097
Claims priority, application Japan, May 26, 1989, 1-60396[U]
Int. Cl.[5] G02B *27/00;* H04N *5/72*
U.S. Cl. 359—601 7 Claims



1. A portable display equipment comprising an image display unit, and an external light preventing member of a polygonal cylinder detachably mounted in front of a display portion of said image display unit, said external light preventing member including:

a shielding member for covering a periphery of the display portion of said image display unit, and a light-shielding member of a polygonal cylinder consisting of a plurality of light-shielding plates which are coupled to each other so as to be freely bent and constitute one sheet member when developed, said light-shielding member being narrowed toward a viewer side by bending coupling portions of said light-shielding plates, wherein

said shielding member is coupled to part of an edge of said light-shielding member on a display side thereof so as to be freely bent.

5,069,530

SOLID STATE IMAGE PICK-UP APPARATUS

Yasuaki Nishida; Yoshihiro Fujita; Yoshiki Iino, and Norihiko Kawada, all of Tokyo, Japan, assignors to Nippon Hoso Kyokai and Ikegami Tsushinki Co., Ltd., both of Tokyo, Japan

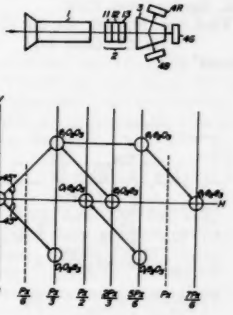
Filed Feb. 20, 1990, Ser. No. 483,211
Claims priority, application Japan, Feb. 21, 1989, 1-39260
Int. Cl.[5] H04N *9/04, 9/097;* G02B *5/20, 27/28*
U.S. Cl. 359—498 7 Claims

1. A solid state image pick-up apparatus comprising

image sensing means including at least one solid state image sensor having a number of light receiving elements arranged in matrix in main- and sub-scanning directions which are perpendicular to each other;

an optical image forming means for forming an optical image of an object to be picked-up and making said optical image incident upon said solid state image sensor; and

optical filtering means for forming trap points and trap lines, including at least one optical filter having at least three quartz plates, the thickness and composition of said optical filter producing trap points at a sampling frequency and near a frequency equal to one and a half times the sampling frequency, no trap point being formed in a frequency range below the sampling frequency, and at said trap point near the frequency equal to one and a half times the sampling frequency, two of said trap lines cross each other at right angles.

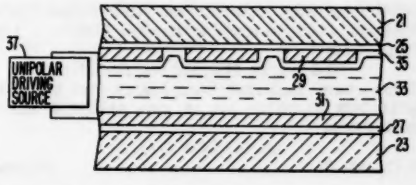


5,069,531

LIQUID CRYSTAL DEVICE HAVING ASYMMETRICAL OPPOSED CONTIGUOUS SURFACES BEING DRIVEN BY A UNIPOLAR DRIVING SOURCE

Shunpei Yamazaki, Tokyo; Toshimitsu Konuma, Atsugi; Toshiji Hamatani, Atsugi; Akira Mase, Atsugi; Toshiharu Yamaguchi, Zama; Mitsunori Sakama, Hiratsuka, and Takashi Inujima, Atsugi, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Continuation-in-part of Ser. No. 928,489, Nov. 10, 1986, abandoned. This application Jul. 27, 1989, Ser. No. 385,927
Claims priority, application Japan, Nov. 11, 1985, 60-252426
Int. Cl.[5] G02F *1/13*
U.S. Cl. 359—55 8 Claims



1. A liquid crystal device comprising:

a unipolar driving source;

a pair of substrates, at least one of which is transparent;

a chiral smectic liquid crystal layer interposed between said substrates; and

an electrode arrangement provided in order to apply an electric field normal to said liquid crystal layer,

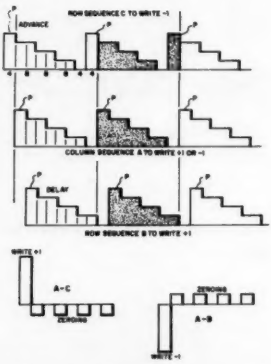
wherein the opposed inner surfaces of said substrates contiguous to said chiral smectic liquid crystal layer are formed of different materials having different surface energies such that upon application of the unipolar voltage to said chiral smectic liquid crystal, the chiral smectic liquid crystal molecules will be placed in a first state and upon removal of the unipolar voltage, the liquid crystal molecules will be returned to a second state.

5,069,532

PIXEL ADDRESSING IN A FERROELECTRIC LIQUID CRYSTAL ARRAY

David F. Taylor, Jr., Elsinore, Calif., assignor to OCA Applied Optics, Inc., Garden Grove, Calif.

Filed Nov. 20, 1989, Ser. No. 426,256
Int. Cl.[5] G02F 1/13
U.S. Cl. 359—56 10 Claims



1. In a ferroelectric liquid crystal array with rows and columns of electrodes and a power supply to address each column and row so that an electric field is applied at the intersection of selected intersections of the rows and columns, a method for changing the state of the ferroelectric liquid crystal at said intersection comprising the steps of,

applying pulses as a column write pulse sequence to a selected column within a selected time unit which sequence will change the state in either of two directions,

applying the same sequence of pulses to a selected row within the same time unit,

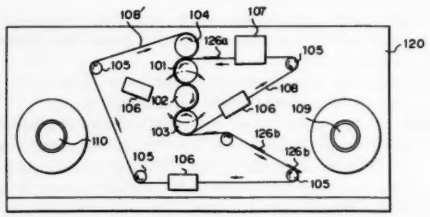
said pulses of said same sequence being advanced or delayed so that the voltage difference between the column write pulses and the same sequence pulses to determine the direction of said change and thus write a +1 or a −1 pixel at said selected intersection.

5,069,533

METHOD OF ORIENTING LIQUID CRYSTAL OPTICAL DEVICE

Kimihiro Yuasa; Kenji Hashimoto, and Tetsuo Fujimoto, all of Sodegaura, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1989, Ser. No. 370,324
Claims priority, application Japan, Jun. 29, 1988, 63-159510; Aug. 24, 1988, 63-208222; Jan. 18, 1989, 63-007704; Mar. 9, 1989, 63-055224
Int. Cl.[5] G02F 1/13
U.S. Cl. 359—76 20 Claims



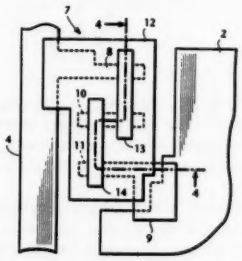
1. A method of orienting a liquid crystal in a liquid crystal optical device including a smectic liquid crystal and two flexible substrates which support a layer of the smectic liquid crystal therebetween and which carry on surfaces facing each other respective electrode layers, which method comprises orienting the smectic liquid crystal by bending the liquid crystal optical device, the bending of the device being within a radius of curvature of 5 to 1,000 mm.

5,069,534

ACTIVE MATRIX LIQUID CRYSTAL DISPLAY WITH SERIES-CONNECTED MIM STRUCTURES AS A SWITCHING ELEMENT

Yoshihiko Hirai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 19, 1990, Ser. No. 511,137
Claims priority, application Japan, Apr. 19, 1989, 1-100455
Int. Cl.[5] G02F 1/13
U.S. Cl. 359—54 3 Claims



1. A liquid crystal display comprising:

a plurality of first electrodes arranged in parallel on a first plane;

a plurality of second electrodes extending in a direction normal to said first electrodes and arranged in parallel on a second plane spaced from said first plane;

a matrix array of pixel electrodes respectively arranged on said first plane at intersections of said first and second electrodes;

a layer of liquid crystal between said first and second planes; and

a matrix array of switching elements associated respectively with said pixel electrodes, each of said switching elements comprising;

a first elongated conductive member extending from the associated first electrode;

a second elongated conductive member extending in a direction parallel to said first conductive member and disposed on a same plane as said first elongated conductive member;

a third elongated conductive member extending from the associated pixel electrode in a direction parallel to said first and second elongated conductive members and disposed on the same plane as said first and second elongated conductive members;

a fourth elongated conductive member overlying said first and second elongated conductive members;

a fifth elongated conductive member overlying said second and third elongated conductive members; and

a nonlinear resistance layer having a first surface contacting said first, second and third elongated conductive members and a second, opposed surface contacting said fourth and fifth elongated conductive members.

5,069,535

ELECTROCHROMIC LAYER-SET

Friedrich G. K. Baucke, Mainz; Jutta Braun, Flörsheim, and Bernd Metz, Mainz, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

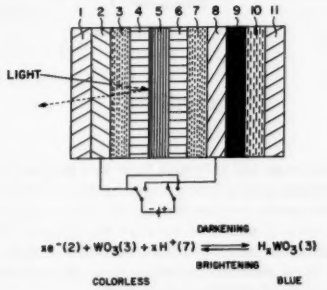
Continuation of Ser. No. 261,526, Oct. 24, 1988, Pat. No. 4,973,141. This application May 29, 1990, Ser. No. 529,419

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1987, 3736075

The portion of the term of this patent subsequent to Nov. 27, 2007, has been disclaimed.

Int. Cl.[5] G02F *1/01*

U.S. Cl. 359—273 20 Claims



1. An electrochromic layer-set comprising a transparent substrate plate, arranged on the front face of the layer-set, a transparent electrode, at least one electrochromic layer, a hydrogen-storing layer, a hydrogen ion-conducting layer, at least one additional electrode, a catalytic layer being simultaneously capable of functioning as an electrode, a rear face in immediate contact with the catalytic layer, said rear face comprising a metalic layer.

5,069,536

ZOOM LENS SYSTEM

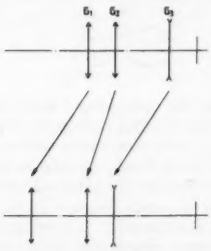
Yasuji Ogata, Tokyo, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan

Filed May 30, 1989, Ser. No. 358,434

Claims priority, application Japan, May 31, 1988, 63-131626; Dec. 28, 1988, 63-329189

Int. Cl.[5] G02B *15/00*

U.S. Cl. 359—689 7 Claims



1. A zoom lens system comprising:

in the recited order from the object side, a first lens unit having positive refractive power, a second lens unit having positive refractive power and a third lens unit having negative refractive power, and

means for varying focal length by displacing said first lens unit integrally with said third lens unit toward the object side and displacing said second lens unit toward the object side at a speed slower than that of said first lens unit,

said zoom lens system satisfying the following conditions (1) through (3):

$$2.5 < f_1/fw < 6 \quad (1)$$

$$0.6 < f_2/fw < 1 \quad (2)$$

$$2 < f_1/f_3/ < 7 \quad (3)$$

wherein the reference symbols f_1, f_2 and f_3 represent focal lengths of the first lens unit, the second lens unit and the third lens unit respectively, and the reference symbol fw designates focal length of the zoom system as a whole at the wide position thereof.

5,069,537

IMAGE DEFLECTING DEVICE

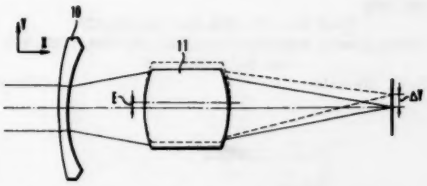
Nozomu Kitagishi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1988, Ser. No. 283,570

Claims priority, application Japan, Dec. 23, 1987, 62-325716

Int. Cl.[5] G02B *27/64, 26/08*

U.S. Cl. 359—557 13 Claims



1. An optical device for deflecting an image, comprising:

objective lens means including a plurality of lens units; and

driving means for causing one lens unit of said plurality of lens units to decenter relative to an optical axis of said optical device,

where an image magnification of said one lens unit is denoted by βc, the following condition being satisfied:

$$-1.4 < \beta c < -0.7$$

5,069,538

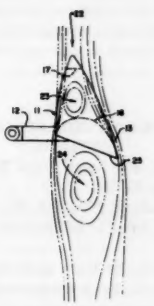
AERODYNAMIC DEFLECTOR FOR A REAR VIEW MIRROR WITH AN INTEGRAL SIDE MARKER LIGHT

Deborah J. Shust; Robert J. Selzer, and Dennis A. Adamisin, all of Fort Wayne, Ind., assignors to Navistar International Transportation Corp., Chicago, Ill.

Filed Feb. 2, 1990, Ser. No. 474,175

Int. Cl.[5] G02B *7/18*

U.S. Cl. 359—871 13 Claims



5. A rear view mirror assembly having a side marker light for a vehicle comprising:

a mounting bracket for supporting the mirror assembly on said vehicle;

a mirror housing mounted on said bracket, said housing having a light reflecting surface on the front portion thereof, and a mirror supported within said housing and providing an image reflecting surface on the rear of said mirror housing;

an air deflector disposed forwardly of said mirror housing for deflecting air around said mirror housing, and defining therewith an open area permitting vision through the mirror assembly therebetween; and,

a light mounted to said mirror assembly in said open area adjacent said air deflector and disposed to direct light on said light reflecting surface thereby providing an exterior indication of the side of the vehicle.

5,069,539

AIRTIGHT JOINING ELEMENT BETWEEN AN EXTERNAL CONTAINER AND A SUPPORTING ELEMENT FOR AN EXTERNAL REARVIEW MIRROR ASSEMBLY FOR A VEHICLE

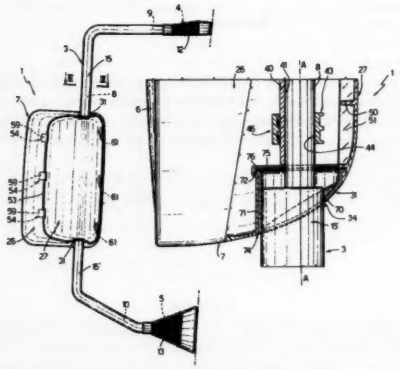
Giuseppe Valde, Turin, Italy, assignor to Gulardini S.p.A., Turin, Italy

Filed Mar. 20, 1990, Ser. No. 496,428

Claims priority, application Italy, Mar. 20, 1989, 52952/89[U]

Int. Cl.[5] G02B *7/18*

U.S. Cl. 359—514 **14 Claims**



1. An airtight joining element positioned between an external container and a supporting element for an external rearview mirror assembly for a vehicle, said supporting element inserting into said container a section which does not have a circular cross-section, characterized in that said airtight joining element comprises a first airtight part surrounding said supporting element and a second part housed in said container with a circular cross-section coaxial to the rotatinal axis A of said container with respect to said supporting element.

5,069,540

PARABOLIC SOLAR COLLECTOR BODY AND METHOD

Warren W. Gonder, 298 Space View Dr., Colonial Valley, Grants Pass, Oreg. 97526

Filed Oct. 18, 1990, Ser. No. 599,446

Int. Cl.[5] G02B *5/10*

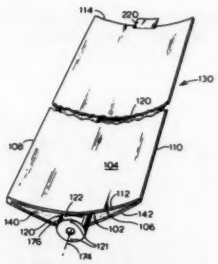
U.S. Cl. 350—631 **18 Claims**

1. A parabolic reflector body fabricated on an elongated, convex parabolic mold, the reflector body being of the type which concentrates solar energy along a focal line, comprising:

an elongated layered structure having a parabolic concave first side, a convex second side opposite said first side and generally parallel longitudinal edges, the layers of said structure including

a reflective layer on said concave first side which contacts and conforms to the mold during fabrication, and

a support layer bonded to said reflective layer on said convex second side, said support layer being predominately formed of an amorphous hard-curing adherent material



applied over said reflective layer in a moldable state and conformed generally to the convex shape of the mold, and

a tubular beam member bonded to said support layer by adherence of said beam member to amorphous hard-curing adherent material along a side of said beam member, said beam member extending longitudinally parallel to said edges of said layered structure.

5,069,541

RIGID FRAMED SAFETY GOGGLES HAVING REPLACEABLE LENS

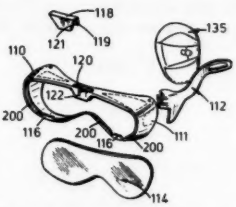
John A. Holmes, Hartesfinch, United Kingdom, and Kazimierez J. Korny, Maughold, Isle of Man, assignors to Hellberg International Limited, Isle of Man

Filed Jul. 31, 1989, Ser. No. 386,615

Claims priority, application United Kingdom, Aug. 2, 1988, 8818345; Oct. 25, 1988, 8824958

Int. Cl.[5] G02C *1/00*

U.S. Cl. 351—86 **9 Claims**



1. A safety spectacle comprising a frame, lens means comprising a selected one of either twin lenses or a single lens, said lens means having inside and outside surfaces and peripheral edges, an aperture in the frame, the aperture defining a peripheral boundary configured to interchangeably receive either said twin lenses or said single lens said peripheral edges of the lens means being constrained by said peripheral boundary of the aperture, abutment means on at least part of said aperture providing retention faces to said inside surface and outside surfaces of said lens means, and centrally disposed clip means which is substantially U-shaped in cross-section and having a first limb by way of which it is releasably slidably locatably engagable with the frame, and having a second limb substantially parallel with the first and spaced therefrom and which overlies part of the outside surface of said lens means in its engaged position to retain said lens means in the aperture in conjunction with the operation of said abutment means, and wherein the retention faces to the inside and outside surfaces are so disposed as to allow insertion and removal of said lens

means upon movement of said clip means from its engaged position.

5,069,542

CONTACT LENS

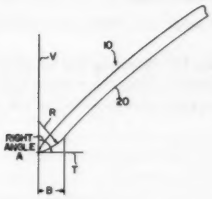
Peter Höfer, Aschaffenburg; Ulrich Müller, Johannesberg; Manfred Bärenz, Dreieich; Horst Schäfer, Aschaffenburg-Obernau, and Wolfgang Müller-Lierheim, Aschaffenburg, all of Fed. Rep. of Germany, assignors to Titmus Eurocon Kontaktlinsen GmbH & Co. KG., Aschaffenburg, Fed. Rep. of Germany

Continuation of Ser. No. 187,905, Sep. 17, 1980, abandoned. This application Apr. 21, 1988, Ser. No. 186,674

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1980, 3002664

Int. Cl.[5] G02C *7/04*

U.S. Cl. 351—160 H **10 Claims**



1. A contact lens comprising:

a contact lens member,

means comprising an elliptical inside surface on the lens member for fitting an eye,

the elliptical inside surface having a numerical eccentricity of from 0.2 to less than 0.4, and a zenith radius of curvature of from 0.8 to 8.4 mm, and

a bevelled zone peripheral of the elliptical inside surface having a circular cross section of radius (R), a width (B) which is 0.5% to 4.0% of the total lens member diameter, and a seamless, tangential junction with the elliptical inside surface.

5,069,543

APPARATUS FOR MEASURING DISTANCES AT MANY POINTS

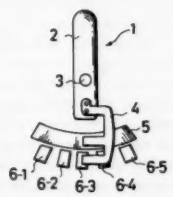
Tomoya Kitajima, Kawasaki, and Akira Suzuki, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 22, 1990, Ser. No. 482,962

Claims priority, application Japan, Feb. 23, 1989, 1-41737

Int. Cl.[5] G01C *3/08*

U.S. Cl. 356—4 **11 Claims**



1. An apparatus for measuring distances at many points and having means for performing a distance measuring operation, said apparatus comprising:

a projector for selectively irradiating a projected light beam to an object to be photographed in a plurality of directions;

a light-receiving element for receiving said projected light beam reflected from said object to be photographed;

a selecting circuit for detecting at least one direction of the projected light beam corresponding to a predetermined magnitude of change in output caused in said light-receiving element when the light beam projected from said projector is selectively irradiated to the object to be photographed in the plural directions and for thereby judging whether the object to be photographed at a short distance is located at any one of plural distance measuring points; and

a measured distance detecting means for performing the distance measuring operation in the at least one direction of the projected light beam detected by said selecting circuit and providing measured distance information with respect to at least one measuring point.

5,069,544

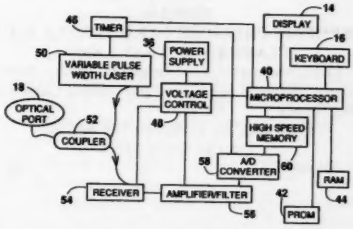
ADAPTIVE PULSE WIDTH OPTICAL FAULT FINDER

Richard Buerli, Ventura, Calif., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 12, 1990, Ser. No. 508,844

Int. Cl.[5] G01N *21/88*

U.S. Cl. 356—73.1 **21 Claims**



1. A device for detecting faults in an optical fiber, comprising:

means for receiving an optical signal emanating from a near end of the optical fiber, said optical signal resulting from the propagation of a first test pulse through the optical fiber, and said optical signal including at least one discrete loss having an associated signal level;

means for optically coupling said receiving means to the near end of the optical fiber; and

processing means electrically connected to said receiving means for computing an optimized pulse width for a second test pulse, based on said signal level at said discrete loss.

5,069,545

LASER RADAR SYSTEM

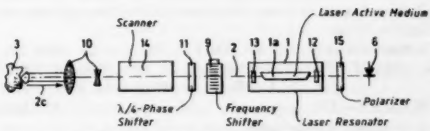
Alexander Hinz, Königsbronn, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Mar. 1, 1990, Ser. No. 486,767

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1989, 3907042

Int. Cl.[5] G01P *3/36*

U.S. Cl. 356—28.5 **14 Claims**



1. A laser radar method for detecting stationary and movable objects and for measuring velocity, the method comprising the steps of:

illuminating the object with a laser transmitted beam gener-

ated by a laser defining a laser resonator thereby causing laser light to be backscattered from the object;

generating a laser beam with a laser defining a laser resonator containing a medium with the resonator having a first natural frequency corresponding to a transversal mode thereof and a second natural frequency corresponding to a longitudinal mode thereof;

passing the laser beam through a λ/4-phase shifter and illuminating the object with the laser beam thereby causing light to be backscattered from the object;

passing the backscattered light through a frequency shifter for imparting a frequency offset to the backscattered light;

selecting the frequency shifter to have a predetermined doubled modulation frequency which corresponds to one of said first and second natural frequencies;

coupling the backscattered laser light into the laser resonator; and,

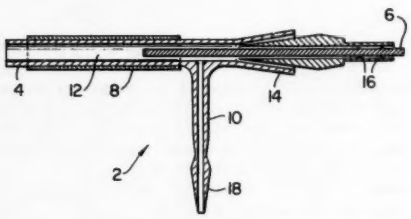
passing the backscattered light from the laser resonator to an optical element for defining the polarization direction of the backscattered light and a polarizer whereafter the backscattered light is passed to and detected by an optical heterodyne receiver.

5,069,546

ATMOSPHERIC PRESSURE CAPACITIVELY COUPLED PLASMA SPECTRAL LAMP

Dong C. Liang, Vancouver, and Michael W. Blades, Surrey, both of Canada, assignors to University of British Columbia, Vancouver, Canada

Filed Aug. 31, 1989, Ser. No. 401,181
Int. Cl.[5] G01N *21/73*
U.S. Cl. 356—316 **14 Claims**



1. A method of generating atom line or ion line spectra from a substance which comprises sustaining an atmospheric pressure plasma in a plasma containing volume having first and second capacitively arranged electrodes enclosing at least a portion of the plasma containing volume, said first and second electrodes being connected to a radio frequency generator and said first electrode being insulated from the plasma, said second electrode being constructed of the substance, said second electrode penetrating into the plasma so that there is an overlap between the second electrode and the first electrode.

5,069,547

MULTITRACK MULTILEVEL SENSING SYSTEM WITH ERROR DETECTING

Raymond W. Huggins, Mercer Island, and Charles R. Porter, Redmond, both of Wash., assignors to The Boeing Company, Seattle, Wash.

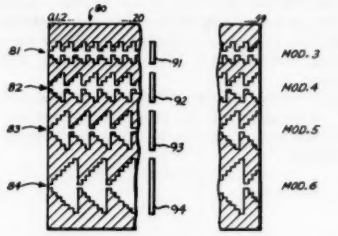
Continuation-in-part of Ser. No. 275,208, Nov. 23, 1988, Pat. No. 4,964,727. This application Aug. 31, 1990, Ser. No. 576,270
Int. Cl.[5] G01B *11/14*; H01J *3/14*
U.S. Cl. 356—374 **10 Claims**

1. A sensor, comprising:

encoding means having a sensing axis and three or more tracks extending along the sensing axis;

each track i having a modulus (m_i) and a property that varies along the sensing axis such that the property can have one of m_i distinguishable levels, the moduli m_i all being pairwise relatively prime;

the tracks being formed such that a value is associated with each position along the sensing axis of the encoder, the level of each track i at a position being equal to the residue



of the value associated with the position to modulus m_i; and

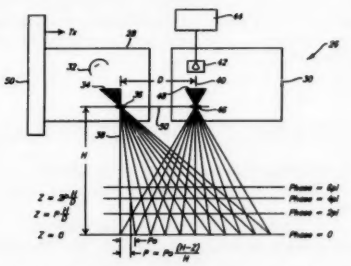
detection means for detecting the levels of the tracks at a detection position along the sensing axis and for producing output signals corresponding to the levels.

5,069,548

FIELD SHIFT MOIRE SYSTEM

Albert J. Boehnlein, Ypsilanti, Mich., assignor to Industrial Technology Institute, Ann Arbor, Mich.

Filed Aug. 8, 1990, Ser. No. 564,104
Int. Cl.[5] G01B *11/24*
U.S. Cl. 356—376 **8 Claims**



1. A moire interferometry system for measuring the range of points on a contoured surface, said system comprising:

a projection system including a light source, a master grating, and a first lens having a principle plane generally perpendicular to said surface, said projection system projecting a series of diverging lines on said surface;

a stationary viewing system including a means for recording on image, a submaster grating having lines, and a second lines having a principle plane generally perpendicular to said surface, said means for recording an image disposed so as to view said projected lines on said surface through said submaster grating, wherein the intersection of said projected lines on said surface and said lines on submaster grating produces moire fringes; and

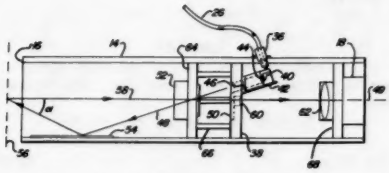
means for translating the projection system, said translation being in a direction perpendicular to the principle planes of the projection and viewing lenses, wherein the translation of said projection system produces a shift in the position of said moire fringes on said surface at a point, said shift being proportional to the range of said surface at said point.

5,069,549

MOIRE CONTOURING CAMERA

Kevin G. Harding, Ann Arbor, Mich., assignor to Industrial Technology Institute, Ann Arbor, Mich.

Filed Nov. 2, 1990, Ser. No. 608,571
Int. Cl.[5] G01B *11/24*
U.S. Cl. 356—376 13 Claims



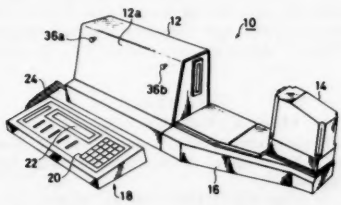
1. A moire contouring imaging device comprising:
an optical grating,
a primary lens,
light source means for projecting a beam of light along an illumination beam path, through said grating and said primary lens such that an image of said grating is projected onto an object focal plane, and
viewing optical means for defining a viewing beam path in which light reflected from said object focal plane passes through said grating and said primary lens, wherein said illumination beam path and said viewing beam path are inclined with respect to one another at an occlusion angle at said object plane so that contours of an object at said object focal plane create moire fringe patterns.

5,069,550

OPTICAL MEASURING MACHINE WITH DETACHABLE OPERATING BOARD

Yoshiharu Kuwabara, Machida, and Masamichi Suzuki, Yokohama, both of Japan, assignors to Mitutoyo Corporation, Tokyo, Japan

Filed Sep. 24, 1990, Ser. No. 587,102
Claims priority, application Japan, Sep. 29, 1989, 1-114256[U]
Int. Cl.[5] G01B *11/02*
U.S. Cl. 356—383 8 Claims



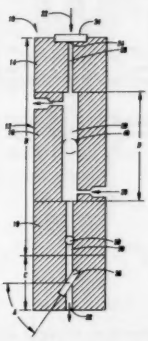
1. An optical measuring machine having a main body comprising a light emitting portion and a light receiving portion, the machine constructed so as to measure the length of an object of measurement by the amount of light which is emitted from said light emitting portion and is shaded by said object, said optical measuring machine further comprising:
an operating board which is provided separately from the main body of said optical measuring machine and which inputs measuring conditions and/or outputs measured results; and
a retaining portion for removably retaining said operating board on a side surface of said main body of said measuring machine with a back surface of said operating board faced to the side surface of said main body.

5,069,551

METHOD AND APPARATUS OF MEASURING UNBURNED CARBON IN FLY ASH

Robert C. Brown, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Nov. 24, 1989, Ser. No. 440,686
Int. Cl.[5] G01N *21/85, 15/02*
U.S. Cl. 356—432 7 Claims



1. A method for detecting loading of unburned carbon particles in the exhaust of coal-fired combustors using photoacoustic absorption spectroscopy to detect said unburned carbon, said method comprising:
generating an excitation beam;
directing said beam at said exhaust;
generating photoacoustic signals by heat given off said particles in said exhaust when said beam contacts said particles;
said signal detecting unburned carbon particles about 10 microns in diameter or larger;
detecting photoacoustic signals generated; and
determining carbon loading as a function of said signal.

5,069,552

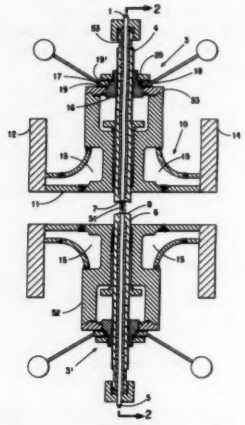
SENSOR-HOLDING DEVICE

Gregory D. Cramer; Roger A. Dupre, both of Seaford, Del., and George H. Hitchcock, Charlotte, N.C., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 1, 1989, Ser. No. 444,778
Int. Cl.[5] G01N *21/85*
U.S. Cl. 356—440 5 Claims

1. A sensing apparatus to determine characteristics of a fluid flowing in a stream by sensing said characteristics in various zones in the cross section of the stream, said apparatus comprising: a body member having an inlet end, an outlet end and a passage defining said stream connecting said inlet end to aid outlet end; a valve stem coupled to said body, aid valve stem being movable through aid stream to engage a seat located

directly opposite said valve stem, said valve stem having a passage therethrough whereby said passage is sealed from said



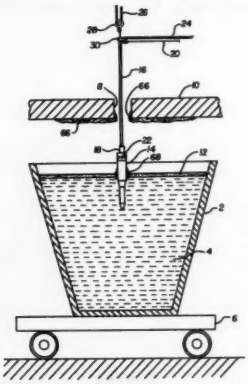
stream when said valve stem engages said set a; and a sensor closely fitted in the passage of said valve stem.

5,069,553

PROTECTIVE SHEATH FOR A CONTINUOUS MEASUREMENT THERMOCOUPLE

R. Michael Phillippi, Highland, Md., assignor to Vesuvius Crucible Company, Pittsburgh, Pa.

Filed Dec. 4, 1989, Ser. No. 621,859
Int. Cl.[5] G01K *1/10;* **H01K** *35/10*
U.S. Cl. 374—140 **19 Claims**



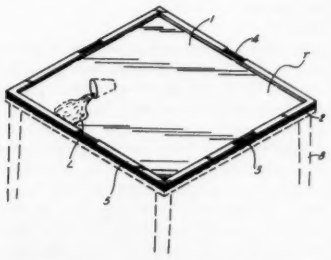
1. A protective thermocouple sheath for use in continuous temperature measurements of molten metal in a ladle and having a slag layer thereon, said sheath comprising an elongated, torpedo-shaped sheath body formed of a refractory composition consisting of magnesia and graphite and having an interior borehole extending axially therein and adapted to receive a thermocouple assembly, said sheath body including a first tapered portion which tapers outwardly from a narrow first closed end to one end of a first cylindrical portion having an outer diameter substantially larger than the diameter of said first closed end, said sheath body further including a second tapered portion which tapers outwardly from the other end of said first cylindrical portion to a second cylindrical portion having an outer diameter substantially larger than the outer diameter of said first cylindrical portion, said second cylindrical portion terminating in a second end of said sheath body, with said borehole extending from the second end, through the second cylindrical portion, second tapered portion and first cylindrical portion and terminating within the first tapered portion, with said first closed end and first tapered portion adapted to penetrate said slag layer, and with said second cylindrical portion adapted to withstand attack thereon from the slag layer.

5,069,554

"TABLECLOTH" DISPOSAL SYSTEM

Geroge M. Bonnett, 5718 St. Charles Ave., New Orleans, La. 70115

Filed Jan. 29, 1990, Ser. No. 471,786
Int. Cl.[5] B65D *30/20*
U.S. Cl. 383—4 **13 Claims**



1. A disposable, temporary covering, such as a tablecloth or the like, for a work surface, such as a table top or the like, which device includes containment means to contain debris placed upon it, comprising:

a flexible sheet which has a main, centrally located surface upon which debris is placed for ultimate disposal and which lies flat in use on the work surface as the debris is placed on it and having at least one, peripherally surrounding edge, said peripherally surrounding edge being raised, extending above the main surface of said sheet a significant distance sufficient to contain liquids spilled upon said main surface, said raised peripherally surrounding edge being formed by a plurality of accordion-type folds; and

cinch means included with said sheet slidingly engaging said peripherally surrounding edge of said flexible sheet for drawing together said peripherally surrounding edge of said flexible sheet forming a container for the debris.

5,069,555

LINEAR BEARING ASSEMBLY

Peter R. Mugglestone, Northport, and Alison Ng, New York, both of N.Y., assignors to Thomson Industries, Inc., Port Washington, N.Y.

Filed Aug. 9, 1990, Ser. No. 565,045
Int. Cl.[5] F16C *29/06*
U.S. Cl. 384—43 **14 Claims**

1. A linear bearing assembly for movement along a shaft comprising:

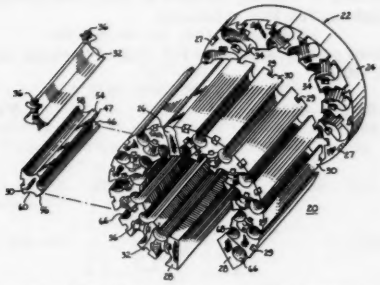
a housing having a pair of opposing end-caps with a plurality of radially angled ball turnarounds formed therein;

a plurality of axial ball tracks with balls therein, having both load bearing paths and return paths disposed within said housing and radially arranged around said shaft in communication with said ball turnarounds;

a plurality of ball retainers having means for retaining said balls in said load bearing paths and means defining a radial inner portion of said return tracks;

a plurality of bearing plates longitudinally positioned in said housing, said bearing plates having a longitudinal groove

formed in a radial inner sur-face thereof which groove forms a top surface of said load bearing path and substantially conforms to an arcuate surface of said balls and said



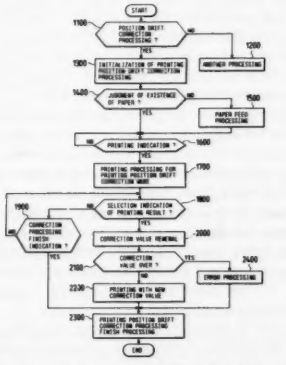
bearing plates further having grooves formed in both circumferential sides for defining sidewall portions of said return tracks.

5,069,556

METHOD FOR CORRECTING DRIFT OF PRINTING POSITION AND PRINTING APPARATUS FOR PRACTISING THE SAME

Hideki Sasaki; Shinji Matsuoka, both of Hitachi, and Akihiko Yamamoto, Toukai, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 16, 1990, Ser. No. 494,540
Claims priority, application Japan, Mar. 17, 1989, 1-63750
Int. Cl.[5] B41J *3/42*
U.S. Cl. 400—74 **12 Claims**



1. A method for correcting a drift of a printing position in which a print head is moved toward a forth and back direction at a width direction of a printing paper, said printing paper is moved in a lengthwise direction of said printing paper, a movement signal occurs every predetermined amount of a movement of said print head and is counted, said print head prints a printing pattern by reading said printing pattern in accordance with a predetermined detection position which is indicated by a counting value of said movement signal, an input apparatus prints said printing pattern on said printing paper, and a printing position drift, which is relative to at a width direction during a forth passage printing and a back passage printing in said input apparatus, is corrected wherein

in a printing with a printing position correction mode;

in one of said forth and back movement of said print head, a first test printing pattern control for moving said print head is carried out by occurring a first test printing pattern at a predetermined detection position which is indicated by said counting value;

in the other of said forth and back movement of said print head, a second test printing pattern control for moving said print head is carried out by occurring a second test printing pattern at a predetermined detection position which is indicated by said counting value, said second test printing pattern is occurred at a displacement position with an amount of a predetermined movement in a front side or in a rear side with respect to said predetermined detection position;

by selecting and inputting a relative test printing pattern, which is printed during a forth and back direction printing and has a minimum printing position drift, a displacement value in a one-way test printing pattern control for printing a selected test printing pattern is detected; and

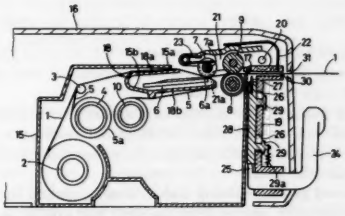
a detection position correction value is obtained and memorized in accordance with said detected displacement value.

5,069,557

DEVICE FOR FEEDING RECORDING MEDIUM IN THE LONGITUDINAL RECORDING DIRECTION

Susumu Kuzuya, Gifu; Seiji Shimizu; Mikio Kato, both of Nagoya; Yujiro Ishikawa, Toyota; Takashi Sakai, Nagoya, and Eiji Yuki, Owariasahi, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Division of Ser. No. 271,085, Nov. 14, 1988, Pat. No. 4,976,558.
This application May 16, 1990, Ser. No. 524,012
Claims priority, application Japan, Nov. 19, 1987, 62-292729; Mar. 15, 1988, 63-34269
Int. Cl.[5] B41J *3/20*; B32B *31/00*
U.S. Cl. 400—120 **6 Claims**



1. A printing apparatus for printing on a recording tape in a printing direction parallel to a longitudinal direction of said tape, comprising:

a platen roller rotatable about an axis perpendicular to said printing direction;

a print head for printing characters on said recording tape according to input data such that said tape is held in contact with said print head and said platen roller;

a covering tape supply device for delivering a covering tape for covering one of opposite surfaces of said recording tape on which printing is effected by said print head;

a pair of presser rollers for superposing the covering tape delivered by said covering tape supply device, on a printed length of said recording tape, so as to cover said one surface of the recording tape, said pair of presser rollers defining therebetween a pressure nip through which are passed said covering tape and said printed length of said recording tape which have been superposed on each other, for securing said covering tape to said printed length of the recording tape; and

a drive device for rotating at least one of said pair of presser rollers for feeding said covering tape and said printed length of the recording tape in said longitudinal direction.

5,069,558

AIR-SUPPORTED LAYING ROLLER FOR TEXTILE YARN

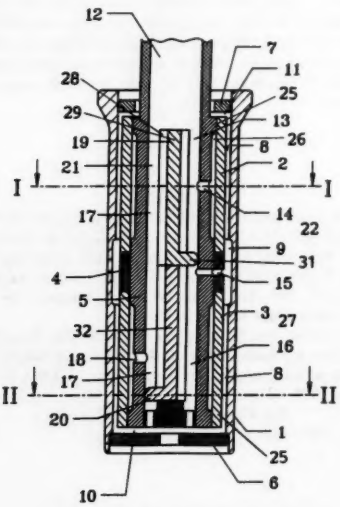
Franz Dinnebier, Niederwerrn, and Hans Hermanns, Hammelburg, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer, Fed. Rep. of Germany

Filed Nov. 16, 1990, Ser. No. 614,634

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1989, 3939004

Int. Cl.[5] F16C *32/06*

U.S. Cl. 384—115 20 Claims



1. An air-supported laying roller for textile yarn comprising:

a central shaft, first and second separated air feed channels through the central shaft;

a first porous bushing extending around the outside of the shaft and spaced from the shaft for defining a first air distribution chamber around the exterior of the shaft and inside the interior of the bushing;

a second porous bushing also extending around the outside of the shaft, spaced from the shaft and axially away from the first porous bushing for defining a second air distribution chamber around the exterior of the shaft and inside the interior of the bushing;

a first air passage from the first air feed channel to the first chamber inside the first porous bushing for delivering air for distribution through the first chamber;

a second air passage from the second air feed channel to the second chamber inside the second porous bushing for delivering air for distribution through the second chamber;

a roller shell disposed outside the shaft and the bushings, having an exterior on which textile yarn may be laid and having an interior of a dimension so as to be spaced from the exterior of the porous bushings;

the porous bushings being porous for permitting passage therethrough and uniform distribution of air from the respective first and second chambers within the porous bushing to define a respective first and second air cushion around the exterior of the first and second bushings, respectively and inside the interior of the roller shell, and the first and second air cushions serving as an air bearing for the shell to rotate around the porous bushings and the shaft.

5,069,559

BEARING WITH SELECTABLE ELECTRICAL CONDUCTIVITY

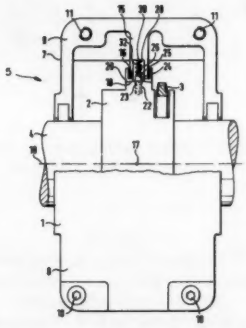
Hans Muller, Hanover, and Joachim Trapp, Laatzen, both of Fed. Rep. of Germany, assignors to Renk Aktiengesellschaft, Augsburg, Fed. Rep. of Germany

Filed Jan. 18, 1991, Ser. No. 642,909

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1990, 4002402

Int. Cl.[5] F16C *17/12, 19/50*

U.S. Cl. 384—277 7 Claims



1. A kit for assembly of a spherical bearing with selectable electrical conductivity, the kit comprising a bearing housing of electrically conductive material, a bearing body of electrically conductive material and a layer of electrically insulating material adapted to be positioned between the body and the housing, the body having an annular convex supporting surface, the housing having an annular concave seating surface, the seating surface, the insulating material and the supporting surface forming a ball and socket joint having a center around which the body is swivelable relative to the housing when the insulating material is not clamped with the force required for operation of the bearing, the kit further including first means for limiting movement of the body relative to the housing, the first means including means for providing an electrical connection between the housing and the body, the kit further including second means for limiting movement of the body relative to the housing, the second means including means for electrically insulating the body from the housing in the event the second means contacts both the body and the housing, the first and the second means for limiting movement of the body relative to the housing being interchangeable and one of the said means for limiting movement being selected for a bearing assembly depending on the electrical conductivity requirements of a specified bearing application.

6. A spherical bearing, the bearing comprising a bearing housing of electrically conductive material, a bearing body of electrically conductive material, the bearing body being carried in the housing, a layer of electrically insulating material positioned between the body and the housing, the body having an annular convex supporting surface, the housing having an annular concave seating surface, the seating surface, the insulating layer and the supporting surface forming a ball and socket joint having a center around which the body is swivelable relative to the housing when the insulating layer is not clamped with the force required for operation of the bearing, the bearing further including positioning means for limiting movement of the body relative to the housing, the housing including a recess, the body including a bore, the positioning means comprising a pin seated into the bore and projecting into the recess, the positioning means further including means for electrically interconnecting the body with the housing, the means for electrically interconnecting the body with the housing including a compression spring formed of electrically conductive material, the compression spring bearing against

both the recess and the pin, the pin being formed of electrically conductive material.

5,069,560

CAGE FOR SEALING A BEARING

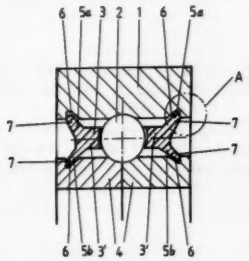
Rudolf Niedermeier, Gerolzhofen, and Johannes Schottdorf, Hammelburg, both of Fed. Rep. of Germany, assignors to FAG Kugelfischer Georg Schafer, Fed. Rep. of Germany

Filed Nov. 16, 1990, Ser. No. 614,619

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1989, 8914265[U]

Int. Cl.[5] F16C *33/72, 33/38*

U.S. Cl. 384—486 11 Claims



1. A bearing comprising a radially inward inner ring, a radially outward ring, a plurality of bearing rolling elements disposed between the inner and the outer rings, the inner and the outer rings having respective opposed inner and outer raceways on which the rolling elements travel, and a bearing separator cage between the inner and the outer rings for receiving and separating the rolling elements between the rings;

the rings having opposite axial ends; axially outwardly past each axial side of the rolling elements, the inner raceway of the inner ring having a radially inwardly directed annular groove and the outer raceway of the outer ring having a radially outwardly directed annular groove; each of the annular grooves in the inner and outer raceways includes an obliquely oriented lateral wall extending in from the respective raceway, with the lateral walls of the annular grooves in the inner ring extending obliquely axially and radially inwardly and the lateral walls of the annular grooves in the outer ring extending obliquely axially outwardly and radially outwardly;

axially outwardly past each axial side of the rolling elements, the cage having a respective first obliquely axially outwardly and radially inwardly directed projection with a first sealing lip at the end of the first projection and being so placed on the cage and so shaped as to extend into the respective radially inwardly directed annular groove in the inner raceway, and the cage having a respective outwardly directed projection with a second sealing lip at the end of the second projection and being so placed on the cage and so shaped as to extend into the respective outwardly directed annular groove in the outer raceway; the respective projection in each of the grooves having a respective oblique surface which is parallel to and opposite the lateral wall of the groove;

each of the annular grooves in the inner and outer raceways further including a respective second lateral wall of each of the grooves in the inner and outer rings and the respective sealing lip of the projection in each groove extends toward and is of a length to rest against the second lateral wall of the groove.

5,069,561

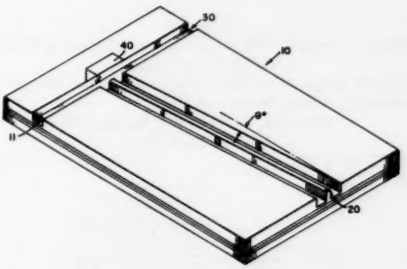
MONOLITHICALLY INTEGRATED RIDGE WAVEGUIDE SEMICONDUCTOR OPTICAL PREAMPLIFIER

William C. Rideout, Townsend; Roger P. Holmstrom, Wayland; Elliot Eichen, Arlington; William Powazinik, Marlborough; Joanne LaCourse, Hudson; John Schlafer, Wayland, and Robert B. Lauer, Stow, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jul. 24, 1990, Ser. No. 557,276

Int. Cl.[5] H01S *3/19*

U.S. Cl. 385—14 12 Claims



1. A wide-bandwidth monolithically integrated optical preamplifier for amplifying and detecting an input optical signal, comprising:

an amplifying region including a large spot size, single-transverse mode traveling wave amplifier having an active layer for receiving said input signal, wherein said amplifier is oriented at an angle with respect to a crystal plane through said preamplifier;

an optical detection region having an absorbing layer for detecting said amplified light; and

an air gap electrical isolation region interposed between said amplifying and optical detection regions, and having a depth below the active layer of said amplifier.

5,069,562

CONTINUOUS PAPER AUTOLOADING MECHANISM FOR THERMAL PRINTER

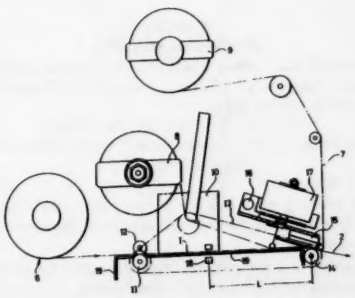
Yasuhiko Matsuda, Iwate, Japan, assignor to Kabushiki Kaisha Sato, Japan

Filed Jul. 30, 1990, Ser. No. 559,261

Claims priority, application Japan, Aug. 24, 1989, 1-098799[U]

Int. Cl.[5] B41J *3/00;* B65H *25/00*

U.S. Cl. 400—120 12 Claims



1. A continuous paper autoloading mechanism for a thermal printer, the autoloading mechanism comprising:

a continuous paper supply section, a paper feeding means for feeding continuous paper from the supply section, a pitch sensor for detecting a pitch of labels or tags associated

with the continuous paper and for producing pitch signals, and a printing means for printing information on the labels or tags, the printing means including means for feeding the continuous paper,

the continuous paper supply section, the paper feeding means, the pitch sensor and the printing means being disposed in succession in the direction of paper feed, feeding of the continuous paper by the paper feeding means and the printing means being synchronized and controlled in response to the pitch signals and being effective for feeding a leading edge of the continuous paper into proper alignment with the printing head.

5,069,563

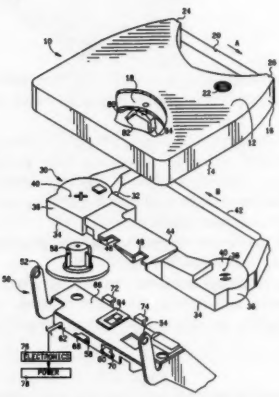
RIBBON CARTRIDGE MOUNTING MOVABLE POWER SWITCH TAB

Robert W. Daggs, Simi Valley, Calif., assignor to General Ribbon Corporation, Chatsworth, Calif.

Filed Jun. 29, 1990, Ser. No. 546,326

Int. Cl.[5] B41J *32/00*

U.S. Cl. 400—208 **14 Claims**



1. A ribbon cartridge for mounting on a device, said cartridge comprising a top, a bottom, a side and a ribbon chamber disposed between said top and said bottom, said cartridge further including an outlet extending from said chamber, a ribbon inlet extending into said chamber, and positionable means relative to said cartridge disposed on said cartridge for actuating a power switch in a device in which said cartridge may be mounted.

5,069,564

PRINTING SYSTEM

Mitsumasa Kako, Toukai; Toshiki Morita, Toyoake, and Motoji Wakita, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Aug. 21, 1990, Ser. No. 570,531

Claims priority, application Japan, Nov. 20, 1989, 1-301329

Int. Cl.[5] B41J *11/50*

U.S. Cl. 400—605 **16 Claims**

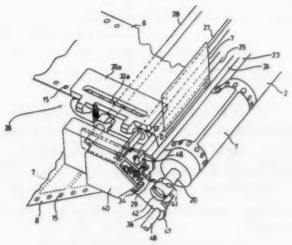
1. A printing apparatus for printing on a label removably adhered to a backing web as well as printing on a normal sheet comprising:

a printing unit for printing input data on print medium including the label and the normal sheet;

a print medium feeding means for feeding the print medium out of the printing unit;

a pair of separating rollers downstream of said printing unit for guiding the backing web with labels in a zigzag fashion to peel a label from the backing web;

a backing web feeding mechanism for drawing the backing web from the separating rollers; and



a frame supported removably on the printing apparatus, and means for mounting said separating rollers and said backing web feeding mechanism on said frame.

5,069,565

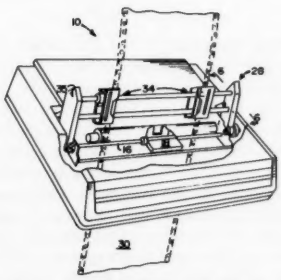
COMPUTER PRINTER FOR PRINTING LABELS AND TAGS HAVING VERTICALLY ORIENTATED TRACTOR FEED

Jeffrey Ayd, 4 Village Cir., Westfield, N.J. 07090

Continuation of Ser. No. 877,842, Jun. 24, 1986, abandoned. This application Dec. 19, 1988, Ser. No. 287,597

Int. Cl.[5] B41J *11/30*

U.S. Cl. 400—616 **14 Claims**



8. A portable computer printer for printing on heavy print media, comprising:

a frame comprised of a base and opposing sides and having a feed slot in the base of said frame;

a platen located within and connected to said frame for guiding said print media, said platen positioned above said feed slot; and

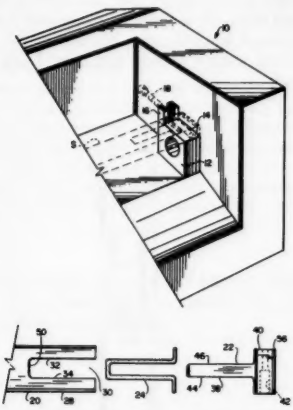
drawing means for vertically drawing said print media through said printer, said drawing means connected to said frame above said platen, wherein said feed slot, said platen and said drawing means define a vertically planar and said drawings means define a vertically planar and substantially frictionless path for said print media, said print media being drawn through said printer without substantial bending, said means for vertically drawing the print media through the printer comprising a tractor assembly having ends for mounting said tractor assembly to opposing sides of said frame and a pair of tractors wherein said tractor assembly is mounted to the sides of said frame in a position substantially perpendicular to the base of said frame by a pair of mounting brackets and retainer assemblies, each said retainer assembly comprising a bolt and locknut combination including a bushing and a retainer washer therebetween wherein said bolt passes through an opening in the side of said frame adjacent said mounting bracket and is further tightened to engage said retainer washer against said mounting bracket thereby securing said mounting bracket to said frame.

5,069,566

ACOUSTICALLY DAMPENED STRIKER BAR FOR IMPACT PRINTERS AND METHODS OF ASSEMBLY

Fred O. Stephens, Waynesboro, Va., assignor to Genicom Corporation, Waynesboro, Va.

Filed Jul. 6, 1990, Ser. No. 548,832
Int. Cl.[5] B41J *11/02*
U.S. Cl. 400—656 16 Claims



1. An acoustically dampened striker bar assembly for an impact printer comprising:

an elongated striker bar having wall surfaces defining a recess in each of its opposite ends;

a member at each f the opposite ends of said striker bar for mounting the bar in the printer;

each member having an element received in the recess in the corresponding end of said striker bar, said element having wall surfaces spaced from and out of contact with said wall surfaces of said striker bar recess;

an elastomeric dampening material disposed between said wall surfaces of said elements and said recesses, respectively; and

said striker bar having a printer impact surface along a front surface thereof and a height dimension smaller than its depth dimension, each said recess being elongated and opening through the top, bottom and end surfaces of said striker bar, said elastomeric material similarly opening through each of the top and bottom surfaces of said striker bar.

5,069,567

CASE

Cameron L. Fink, and Anthony J. Gentile, both of London, Canada, assignors to Sterling Marking Products Inc., London, Canada

Filed Jun. 4, 1990, Ser. No. 532,548
Claims priority, application Canada, Jun. 2, 1989, 601688
Int. Cl.[5] B42F *13/00, 13/40*
U.S. Cl. 402—3 15 Claims

1. Structure for containing incorporation documents, the structure comprising:

a top element of a selected width defining the top and an angled display wall, said wall comprising means to identify the contents of the structure;

a fixed side dependent from both the top and the angled display wall and being rectangular but for an angled edge shaped to meet the display wall;

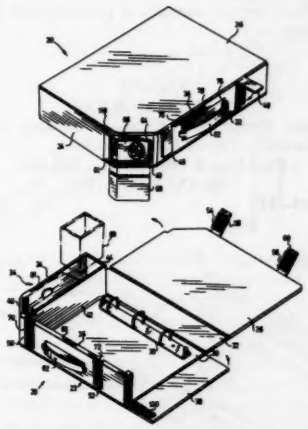
a fixed side wall dependent from the top structure and being of substantially said selected width;

a bottom hinged to the fixed side and being substantially of the selected width;

a lid hinged to the bottom for movement with the bottom into position in engagement with the fixed side wall and the top element, the lid being of a similar shape to that of the fixed side;

a collapsible side wall hinged to the fixed side and of substantially said selected width for movement to meet the lid and the top element when the structure is closed;

means for retaining incorporation documents within said structure;



wall closure means coupled to the collapsible side wall and to the top element to releasably retain this side wall when the structure is closed; and

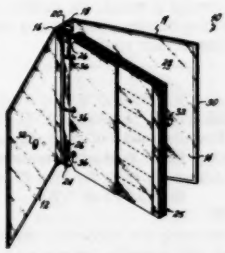
lid closure means coupled to the lid and to the top element to releasably retain the lid when the structure is closed, whereby incorporation documents can be contained when the structure is closed and then made available by releasing the closure means and moving the lid and the collapsible side wall into the plane of the fixed side.

5,069,568

LOOSELEAF BINDER HAVING A REMOVABLE PROTECTIVE ENVELOPE AND METHOD OF MAKING SAME

Fred Acker, Cordova, Tenn., assignor to Kleer-Vu Plastics Corporation, Brownsville, Tenn.

Filed Jul. 30, 1990, Ser. No. 559,626
Int. Cl.[5] B42F *13/00*
U.S. Cl. 402—73 13 Claims



1. A looseleaf binder having a removable protective envelope, said looseleaf binder comprising:

a spine;

a front cover flap and a rear cover flap, each of said cover flaps being hingedly connected to said spine;

a manually tearable protective envelope overlying substantially the entirety of each of said cover flaps as well as at

least a portion of said spine, said envelope being readily removable from at least said flaps, without damaging either said flaps or said spine, upon tearing of said envelope; and

a page binding structure fastened to said spine, said page binding structure overlying at least a portion of both said envelope and said spine;

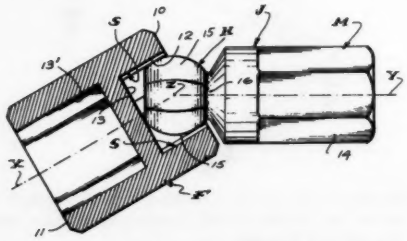
whereby, said front and back cover flaps may be freely pivoted with respect to said spine in order to open and close said looseleaf binder so as to permit substantially complete inspection and use of same at point of sale and elsewhere without necessity of removing said protective envelope.

5,069,569

UNIVERSAL JOINT

Frank Lieser, Wuppertal, Fed. Rep. of Germany, assignor to Ferro Tools Inc., City of Industry, Calif.

Filed May 9, 1991, Ser. No. 698,164
Int. Cl.[5] F16D *3/00*
U.S. Cl. 403—57 **10 Claims**



1. An improved Universal joint comprising an elongate female part with an outer end to connect with one of a pair of elongate rotatable work parts in axial alignment therewith and an inner end with a central elongate axially inwardly opening socket opening having a substantially flat radial axially inwardly disposed bottom and a plurality of circumferentially spaced radially inwardly disposed longitudinally extending, longitudinally straight and laterally convexly curved flats; an elongate male part with inner and outer ends and including a semi-spherical head at its inner end, said head has a plurality of circumferentially spaced radially outwardly disposed, longitudinally extending, laterally straight and longitudinally radially curved convex facets and is engaged in the socket opening in the female part with its facets opposing the flats in the socket opening; and, a shank at the outer end of the male part to connect with the other of said pair of elongate work parts in axial alignment therewith; the flats and facets have laterally spaced longitudinally extending side portions and longitudinally extending central portions, the central portions of the facets establish sliding bearing point-bearing engagement with the central portions of their related flats.

5,069,570

SNUBBER FOR TELESCOPING TUBES

John W. Pryor, Encinitas, and Jeffrey W. Pryor, Vista, both of Calif., assignors to Pryor Products, Oceanside, Calif.

Filed Mar. 23, 1990, Ser. No. 497,689
Int. Cl.[5] F16B *7/10*
U.S. Cl. 403—109 **7 Claims**

1. A snubber assembly for restricting coaxial movement of telescoping tubes, said assembly comprising:

inner and outer telescoping tubes movable relative to one another in a first, tube expanding direction to expand said tubes and in a second, tube collapsing direction opposite to said tube expanding direction to collapse said tubes;

a rigid end piece having a flat outer end surface secured to an internal end of the inner tube within the outer tube;

a washer of flexible material having a cross-sectional area substantially equal to the cross-sectional area of the outer tube, the washer being attached to the outer end surface of the end piece and having an outer peripheral edge contacting the inner surface of the outer tube when the washer is unflexed, the cross-sectional area of the washer being larger than the cross-sectional area of the end piece so that a peripheral rim area of the washer projects outwardly from the outer periphery of the end piece; and

securing means for rigidly securing a central area only of said flexible washer to the outer end surface of said end piece, said control area being of smaller area than the end surface area of said end piece, and leaving the remaining area of said washer outside said central area free and unsecured;

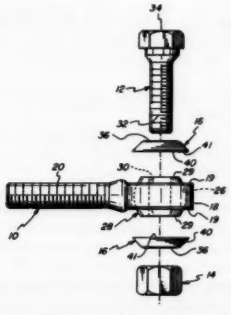
said securing means comprising means for allowing flexing of said remaining, unsecured area of said washer comprising the entire washer area outside said central, rigidly secured area away from said end piece in a first direction when said tubes are moved relative to one another in said tube expanding direction, and said end piece comprising means for allowing flexing of the peripheral rim area only of said washer outside the periphery of said end piece in a second direction opposite to said first direction when said tubes are moved relative to one another in said tube collapsing direction, said peripheral rim area of said washer being smaller than said remaining, unsecured area.

5,069,571

ROD END ASSEMBLY

Joseph A. Matczak, Talcottville, and Stanley E. Matczak, Ellington, both of Conn., assignors to Seals-It, Inc., East Hartford, Conn.

Filed Feb. 7, 1990, Ser. No. 476,154
Int. Cl.[5] F16C *11/00*
U.S. Cl. 403—134 **19 Claims**



1. A spherical rod end assembly comprising: a spherical rod

end having a head portion with an opening of spheric cross section therewithin, and with exterior surfaces on opposite sides of said head portion surrounding said opening; a ball pivotably seated within said opening of said rod end head portion, said ball having a bore therethrough; and fastener means comprised of a plurality of components, a first of said components of said fastener means having a shank portion extending through said bore of said ball, and a second of said components being engaged on said shank portion of said first component, one component of said fastener means on at least one of said sides of said rod end portion being comprised of a rigid body element with a peripheral marginal portion, and an integral, generally annular sealing element of tough, flexible, resilient material, said rigid body element being held by said fastener means against said ball, and said sealing element having an inner portion continuously surrounding said marginal portion of said body element and sealingly affixed thereto, said sealing element also having a wall portion extending from about said inner portion, and terminating at a flexible outer circumferential lip in movable, sealing engagement with said exterior surface of said head portion adjacent thereto.

5,069,572

NUB ASSEMBLY FOR TENT FRAME STRUTS

Mark R. Niksic, Lakewood, Colo., assignor to T. A. Pelsue Company, Englewood, Colo.

Filed Jan. 8, 1990, Ser. No. 461,921
Int. Cl.[5] F16B 7/04
U.S. Cl. 403—170 5 Claims

1. A hub for receiving the ends of tent frame struts, comprising;

a rigid and generally circularly shaped planer base member having,

top and bottom surfaces,

a plurality of radially extending slots through the thickness of the base member,

a like plurality of arcuately extending recesses disposed in the top surface and communicating with the radial slots, each of said recesses being adjacent, along its circumferentially near side, to an arc of reduced base member thickness;

a like plurality of spherically shaped socket means disposed in the arcuately extending recesses, each adapted to receive the proximal ends of an elongated strut;

follower means rotatably attached to the base member, superimposed over the socket means and engageable with the proximal end portions of the struts; and

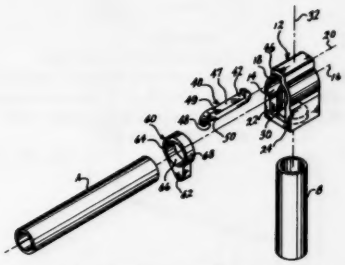
cap means nested over the follower means and secured to the base member and having a like plurality of notches along its lip which are circumferentially co-extensive with the width of the said slots and the arc of reduced base member thickness.

5,069,573

DEVICE FOR RELEASABLY COUPLING ELONGATE CYLINDRICAL MEMBERS

Jimmy H. Blake, Woodinville, and Carl R. Blake, Kirkland, both of Wash., assignors to UCO, Inc., Redmond, Wash.

Filed Jan. 10, 1991, Ser. No. 639,918
Int. Cl.[5] F16B 7/08
U.S. Cl. 403—191 11 Claims



1. A device for releasably coupling a first elongate cylindrical member in selected axial and rotational relation to a second elongate cylindrical member, the device comprising:

a housing having (a) a first bore for receiving one end of a first elongate cylindrical member, said first bore having a first longitudinal axis, and (b) a curved sidewall defining a second bore for receiving a second elongate cylindrical member, said second bore having a second longitudinal axis, wherein said first and second bores are positioned in said housing so that said first axis extends transversely to said second axis; and

clamp means, coupleable with said housing and including a ring cam mounted for rotation about a third movable axis, for causing a selected portion of a second elongate cylindrical member positioned in said second bore to frictionally engage said curved sidewall with a force that varies as a function of the rotational position of said ring cam relative to said third axis so as to permit the second member to be secured in selected axial and rotational relation and predetermined transversely extending relation to said first axis.

5,069,574

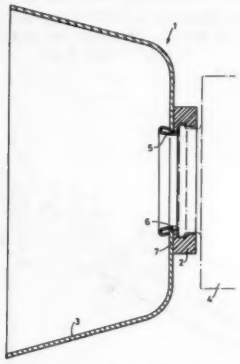
CONNECTION BETWEEN TWO COMPONENTS

Felix Mikeska, Siegburg, Fed. Rep. of Germany, assignor to Jean Walterscheid GmbH

Filed Nov. 20, 1989, Ser. No. 439,273
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1988, 3839378
Int. Cl.[5] F16B 11/00
U.S. Cl. 403—274 4 Claims

1. A connection between two components comprising an extension from one of the components which, for fixing purposes, passes through a hole in the other component, the extension being formed from a plastics material having a memory ability, wherein the extension has a tubular shape, projects beyond the other component, and an end portion of the extension which projects beyond the other component is rolled over

outwardly and backwardly towards the other component and contacts said other component, the end portion of said extension being biased inwardly and contracting toward said extension due to the memory ability of the plastics material.



5,069,575

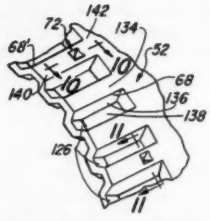
ROLL FORMING NOTCHES IN A THIN-WALL POWER TRANSMISSION MEMBER

Carl Anderson, Mt. Clemens, Mich., assignor to Anderson Cook, Inc., Fraser, Mich.

Division of Ser. No. 406,455, Sep. 13, 1989, Pat. No. 4,956,986, which is a division of Ser. No. 302,374, Jan. 27, 1989, Pat. No. 4,891,962, which is a division of Ser. No. 263,396, Oct. 27, 1988, Pat. No. 4,882,926, which is a division of Ser. No. 88,696, Aug. 21, 1987, Pat. No. 4,819,468. This application May 24, 1990, Ser. No. 528,256

Int. Cl.[5] B25G *3/28*

U.S. Cl. 403—359 **4 Claims**



1. A power transmission member (**52**) comprising: an annular sleeve portion (**58**) having a central axis (**132**), said sleeve portion including a plurality of aligned roll formed notches (**72**) punched therethrough by a rolling process incorporating a mandrel (**50**) received within said sleeve portion (**58**) and a pair of notch forming dies (**84**) having notch forming projections (**70**) along the length of said dies (**84**), and each roll formed notch having one axial end including an inwardly projecting cut edge and having another axial end that is connected to the sleeve portion.

5,069,576

ROAD SAFETY BARRIER

Claude Pomero, Beziers, France, assignor to Les Profiles Du Centre, Saint Pourcain Sur Sioule, France

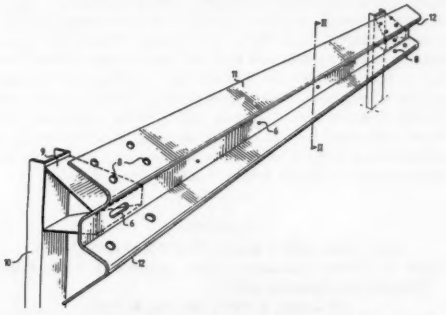
Filed Jan. 16, 1990, Ser. No. 464,132

Claims priority, application France, Jan. 17, 1989, 89 00580

Int. Cl.[5] E01F *15/00*

U.S. Cl. 404—6 **3 Claims**

1. A deformable safety barrier placed along a roadside, the barrier being constituted by metal section bars (**11**) adapted to be assembled to one another by partial overlapping and by bolting, and adapted to be supported at intervals by vertical posts, the section bars (**11**) each having a central groove (**1**) with a rib (**2**) on either side thereof, the ribs having respective vertex lines lying in a common vertical plane which is parallel to a vertical plane (XX') that is tangential to the bottom of the groove (**1**), thereby forming a projection towards the road, each rib also having an outer flange (**3***a*) extending away from the road and extended by a flange extension (**3***b*) beyond the vertical plane (XX') which is tangential to the bottom of the central groove (**1**), the barrier being characterized in that the outer flanges (**3***a*) of the ribs (**2**) of the section bars (**11**) extend beyond said vertical plane (XX') by a distance lying between one-half and twice the distance between said vertical plane (XX') and the plane passing through the vertex lines of the ribs (**2**), and being further characterized in that the lengths of the flange extensions (**3***b*) of each of the section bars (**11**) and the thickness of each of the section bars (**11**) are such that the moment of inertia of the section bars is increased by at least 50% compared with standard A-type or B-type barrier section bars.



5,069,577

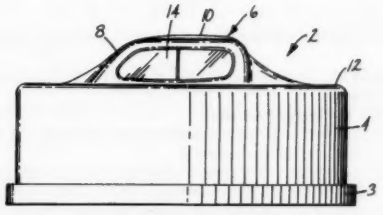
FLEXIBLE RAISED PAVEMENT MARKER

Patrick E. Murphy, 933 Dufferin Ave., London, Ontario, Canada N5W 3K3

Filed Oct. 23, 1990, Ser. No. 601,872

Int. Cl.[5] E01F *9/06*

U.S. Cl. 404—11 **11 Claims**



1. A pavement marker comprising a hollow base having an open bottom and a top closed by a dome having a center, which pavement marker is characterized by:

A. said base having a curved cross sectional shape, selected from circular cylinders, elliptical cylinders, and frustoconical shapes;

B. said dome having:

(2) an outer surface which approximates a surface of rotation of at least a portion of a sine wave oriented so that the part of said outer surface nearest the periphery of the base has a slope substantially lower than the part of said surface midway between the periphery and the dome center;

(2) a cross section thickness which is greater at the center than its average thickness and thinner at the periphery of the dome than the average thickness;

(3) at least two ribs projecting from its surface; and

C. a material of construction which is an elastomer having a glass transition temperature no greater than −50° C.

5,069,578

METHOD AND DEVICE FOR PRODUCING A SURFACE COATING ON A SURFACE SUCH AS A ROAD

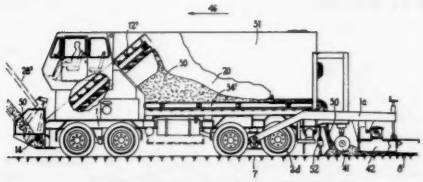
Pierre Bense, Frouard, and Jean-Francois Patte, Saint Max, both of France, assignors to Screg Routes Et. Travaux Publics, Yvelines Cedex, France

Filed Jul. 19, 1990, Ser. No. 556,256

Claims priority, application France, Jul. 21, 1989, 89 09893

Int. Cl.[5] E01C *7/06, 7/32, 3/06*

U.S. Cl. 404—75 **17 Claims**



1. A method for producing a surface coating on a surface, comprising the steps of:

spreading a layer of bituminous liquid binding material on the surface;

spreading a layer of aggregates, comprising loose chips covered with a pasty mixture of bitumen and pulverulent material, over said layer of bituminous liquid binding material;

compacting said layer of aggregates against said layer of bituminous liquid binding material;

wherein said steps of spreading said layer of binding material, spreading said layer of aggregates and compacting said layer of aggregates are performed successively along a particular direction of advance within a period of five seconds or less for any given portion of said surface coating; and

wherein said layer of binding material contains at least 11 percent and no more than 89 percent by weight of the total quantity of bitumen present in said surface coating.

7. A device for producing a surface coating, formed of aggregates and bitumen, on a surface, comprising:

a chassis having a forward end and a rearward end;

a plurality of rolling means spaced longitudinally along said chassis for supporting said chassis such that it can roll along a particular direction of advance;

means for moving said chassis along said direction of advance;

a receiving hopper mounted on said chassis near said forward end thereof for receiving chips;

a storage hopper mounted on said chassis at a central part thereof for storing the chips;

elevator means for conveying the chips upwardly from said receiving hopper and into said storage hopper;

conveyer means for conveying the chips rearwardly from said storage hopper;

at least one reservoir mounted on said chassis for containing liquid bituminous binding material;

spraying means, mounted rearwardly of the rearwardmost of said rolling means, for spraying the liquid bituminous binding material from said at least one reservoir onto the surface as said chassis is being moved forwardly in said direction of advance;

discharge means, disposed rearwardly of said spraying means, for discharging the chips from said conveyer means onto the surface after it has been coated with the liquid bituminous binding material by said spraying means, as said chassis is being moved forwardly in said direction of advance; and

a finishing table, suspended in an articulated manner from said chassis at a location rearward of said spraying means, for compacting the chips discharged onto the surface against the binding material sprayed onto the surface as said chassis is being moved forwardly in said direction of advance.

5,069,579

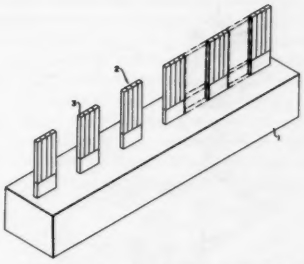
EROSION PREVENTION DEVICE

Richard Burns, 230 SW. 64th Ter., Pembroke Pines, Fla. 33023

Continuation of Ser. No. 493,701, Mar. 14, 1990, abandoned. This application Apr. 30, 1991, Ser. No. 696,297

Int. Cl.[5] E02B *3/04*

U.S. Cl. 405—25 **9 Claims**



1. The combination of means for disposing of tires and preventing erosion of land due to water current, comprising

a concrete block having a top surface and a substantially flat bottom surface, elastic current reduction flaps formed of rubber sections cut from said tires,

each having top and bottom portions,

said bottom portions of said current reduction flaps being embedded in said concrete block and said top portion of said flaps being in the form of a multitude of strips attached to said bottom portions,

and means for retaining said bottom portions in said concrete blocks,

said flaps being bendable relative to said concrete block.

5,069,580

SUBSEA PAYLOAD INSTALLATION SYSTEM

Harry A. Herwig, Woodlands, and Doyle D. Hickok, Houston, both of Tex., assignors to FSSL, Inc., Sugarland, Tex.

Filed Sep. 25, 1990, Ser. No. 588,070

Int. Cl.[5] E02D *23/08;* **E02B** *17/02*

U.S. Cl. 405—191 **21 Claims**

11. A method of landing and securing a payload to a subsea assembly, utilizing a surface vessel and a vessel cable extending from the surface vessel, the method comprising:

providing a submersible payload package including a package cable extending from the payload package;

providing a floatation device attached to the payload package;

suspending the payload from the package cable;

lowering the package and the payload subsea toward the assembly via the vessel cable;

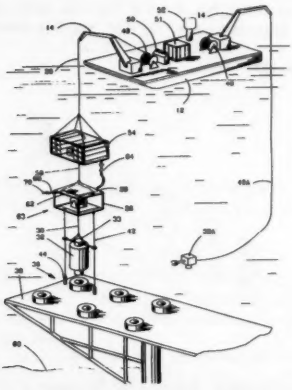
connecting a guide cable extending from the package to the assembly;

thereafter activating the floatation device such that the package becomes positively buoyant, thereby making the guide cable taunt and relaxing the vessel cable to de-couple the package from the surface vessel;

thereafter lowering the payload onto the subsea assembly via the payload cable, with the guide cable remaining taunt;

thereafter connecting the payload to the assembly;
thereafter de-activating the floatation device such that the package is not positively buoyant, thereby making the vessel taunt and the guide cable relaxed to re-couple the package to the surface vessel; and
thereafter retrieving the package to the surface vessel.

16. Apparatus for landing and securing a payload to a subsea assembly utilizing a surface vessel and a vessel cable extending from the surface vessel, the apparatus comprising:
a submersible payload package suspended from the vessel cable;

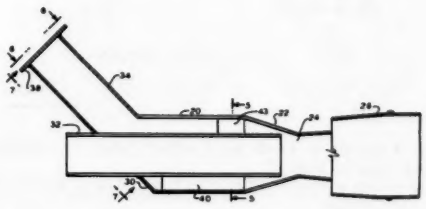


one or more guide cables extending from the payload package for securing to the subsea assembly;
a submersible floatation device connected to the payload package selectively activatable to render the payload package positively buoyant and selectively de-activated so that the payload package is not buoyant;
a powered vessel winch on the vessel for controllably lowering and raising the submersible payload package; and
a powered package winch connected to the payload package for selectively lowering the payload with respect to the payload package.

5,069,581
PROCESS FOR ANCHORING OF FASTENERS IN A BASE
Herbert Kistner, Freiburg, and Christian Weber, Emmendingen, both of Fed. Rep. of Germany, assignors to UPAT GmbH & Company, Emmendingen, Fed. Rep. of Germany
Division of Ser. No. 315,892, Feb. 14, 1989. This application Aug. 27, 1990, Ser. No. 573,675
Claims priority, application Fed. Rep. of Germany, Nov. 13, 1986, 3638750
Int. Cl.[5] E21D *20/02;* **C08L** *63/00;* **C08K** *3/20;* **C08G** *63/48*
U.S. Cl. 405—259.6 **1 Claim**

1. A process for anchoring a fastener in a base comprising:
(1) introducing in a borehole in said base a destructible multiple chamber cartridge containing a reactive set for producing a synthetic resin body, said reactive set containing:
a) 18–25 parts by weight of a preaccelerated resin component containing as ingredients:
A) 3–60 parts by weight of a vinyl ester epoxy resin,
B) 28–45 parts by weight of styrene and/or methyl methacrylate as ethylenically unsaturated monomer compounds,
C) 63–3 parts by weight of an unsaturated polyester resin, which is not an ester of a polyepoxide with an ethylenically unsaturated monocarboxylic acid, and
D) 10–0.1 parts by weight of an epoxy resin, which is not an ester of a polyepoxide with an ethylenically unsaturated monocarboxylic acid, and
b) 0.4–1.2 parts by weight of a hardener component comprising an organic peroxide, and
c) 44–55 parts by weight of a filler component, and additionally accelerators and polymerization inhibitors,
said organic peroxide hardener and said preaccelerated resin component being contained, separate from each other, in different chambers; and
(2) driving said fastener into the borehole so that the multiple chamber cartridge is destroyed and said synthetic resin components are mixed, whereby the synthetic resin is cured and said fastener is anchored in the base.

5,069,582
VACUUM PRODUCING DEVICE
Roger Young, 6 Holmehill La., Roseland, N.J. 07068
Filed Sep. 4, 1990, Ser. No. 577,320
Int. Cl.[5] B65G *53/14*
U.S. Cl. 406—153 **13 Claims**

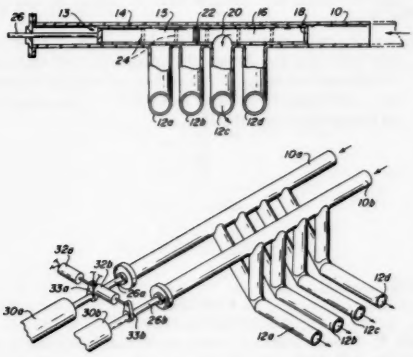


8. A trim vacuuming device for removing trim produced when cutting plastic in the form of a roll, comprising:
a hose having an outlet end and an intake end mounted adjacent to said roll and its trim;
a blower; and
a vacuum producing device comprising:
a conduit having a longitudinal axis and connected to said blower to be pressurized thereby;
a suction tube having an inner end and an outer end connected to said hose;
a hollow housing having a first end with a downstream opening therein, said downstream opening having disposed thereacross a restrictive throat having a passage therethrough extending along a passage axis, said housing having a second end with an upstream wall, said suction tube being mounted through said upstream wall in said housing, said inner end of said suction tube being aligned with and adjacent to said restrictive throat, said housing having a lateral opening, said conduit being mounted at said lateral opening to communicate with said housing, the longitudinal axis of said conduit being oriented at an acute angle with respect to the passage axis of said throat; and
a plurality of equiangularly spaced, radial vanes mounted between said suction tube and said housing, a distal one of said vanes being opposite said lateral opening and longer than an adjacent one of said vanes.

5,069,583
DEVICE FOR CHANGING FLOW PATHS IN A PNEUMATIC CONVEYING SYSTEM
Lawrence G. Caldwell, 12004 Windmere Cir., Waynesboro, Pa. 17268
Filed Oct. 26, 1990, Ser. No. 603,970
Int. Cl.[5] B65G *53/56*
U.S. Cl. 406—182 **14 Claims**

1. Apparatus for directing a fluid stream from a source tube to a selected one of a plurality of outlet tubes in fluid flow communication with the source tube, comprising:

elongated sleeve means coaxially disposed within the source tube, the sleeve means having an inlet port and a single outlet port, the inlet port being in fluid flow communication with the source tube and the outlet port, the sleeve means being longitudinally movable and rotatable within



the source tube for selectively closing all outlet tubes and directing the fluid stream to a desired one of the outlet tubes while closing the remaining outlet tubes; and

means for rotating and longitudinally moving the sleeve means.

5,069,584

HOLLOW DRILLING TOOL

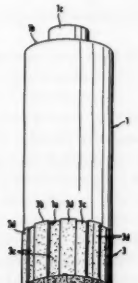
Josef Obermeier, Munich, Fed. Rep. of Germany; Eugen Magyari, Gams, Switzerland; Walter Ritt, Schnifis, Austria; Ernst Wohlwend, Nendeln; Horst-Detlef Gassmann, Ruggell, both of Liechtenstein, and Peter Cavada, Feldkirch, Austria, assignors to Hilti Aktiengesellschaft, Fürstentum, Liechtenstein

Filed Jan. 22, 1990, Ser. No. 468,375

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1989, 3901528

Int. Cl.[5] B23B *27/20*

U.S. Cl. 408—145 **5 Claims**



1. Hollow drilling tool comprising an axially extending tubular carrier part (**1, 11, 21, 31**) with a circumferentially extending radially outer surface having a first end (**1***a*, **11***a*, **21***a*, **31***a*) and a second end, at least one cutting body (**2, 12, 22, 32**), said at least one cutting body having a first end and a second end spaced apart in the axial direction, and a radially outer surface and a radially inner surface, wherein the improvement comprises said at least one cutting body is formed of a material different from that of said carrier part, said radially outer surface of said at least one cutting body has a greater diameter than the radially outer surface of said carrier part so that said at least one cutting body projects radially outwardly beyond said carrier part, guide elements extending in the axial and circumferential direction of said carrier part and extending in the axial direction from contact with said at least one cutting body to contact with said carrier part, said guide elements having a radially outer surface aligned in the axial direction of said carrier part with the radially outer surface of said at least one cutting body for at least a part of the circumferential extent thereof so that the radially outer surface of said guide elements projects radially outwardly from said carrier part, said guide elements having a greater resistance to wear than said carrier part, and said guide elements having an axial extent (**1**, m, n, t) corresponding at least to the axial extent (s) of said at least one cutting body (**2, 12, 22, 32**), said guide elements are formed as segments disposed in spaced relation in the circumferential direction with at least three said segments (**3***d*, **13, 23, 33**) disposed in spaced relation around the circumference, adjacent said segments defining axial extending sides of grooves extending axially from the at least one cutting body and extending radially inwardly from the radially outer surface of said guide element, said guide elements are formed of a material different from said carrier part and said at least one cutting body, and said segments each have a first end and a second end with the segment first end contacting the second ends of one of the at least one cutting body and the segment second ends contacting the carrier part, and said grooves being coextensive with said segments.

5,069,585

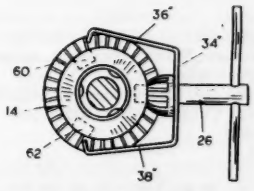
DRILL CHUCK KEY BEARINGS

Otto D. Wenz, Jr., Rte. 1, Box 70-A, Tekamah, Nebr. 68061

Division of Ser. No. 557,947, Jul. 25, 1990, Pat. No. 4,999,018. This application Oct. 29, 1990, Ser. No. 605,976

Int. Cl.[5] B23B *39/00*

U.S. Cl. 408—241 R **3 Claims**



1. A bearing for a drill chuck key, the key of the type having a shank, a gear means at a first end of the shank for cooperation with a drill chuck, and a handle means at a second end for rotating said shank and gear means, the chuck of the type having three equally spaced apertures therearound for receiving the first end of the key, comprising:

a single strip of resilient material bent into a general U-shape to for a main support portion with a pair of legs projecting therefrom, said legs being formed so as to diverge from one another;

the free ends of said legs having bent ends bent towards one another to be received in the chuck apertures;

said diverging legs being formed with the free ends thereof separated a distance greater than the diameter of said drill chuck;

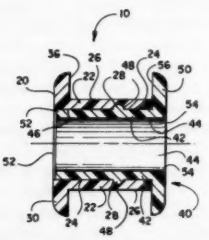
said main portion having an aperture therethrough for receiving the shank of said key.

5,069,586

SELF-LOCKING TWO-PART GROMMET

Marion B. Casey, 1249 Collard Valley Rd., Cedartown, Ga. 30125

Filed Aug. 27, 1990, Ser. No. 573,444
Int. Cl.[5] F16B *19/00, 21/00*
U.S. Cl. 411—339 19 Claims



1. A grommet comprising:

a female member having a female member sleeve which has an inner surface defining a bore through said female member sleeve and which also has an outer surface, said inner surface of said female member sleeve also defining an annular groove, said female member also having a female member flange formed at an end of said female member sleeve opposite an open end of said female member sleeve;

a male member having a male member sleeve slightly smaller than said bore through said female member sleeve, said male member sleeve having an inner surface defining a bore through said male member sleeve and having an outer surface, said outer surface of said male member sleeve having an annular lip corresponding to and for receiving said annular groove defined in said inner surface of said female member sleeve, said male member also having a male member flange formed at an end of said male member sleeve opposite an open end of said male member sleeve, said male member flange having a bottom surface; and

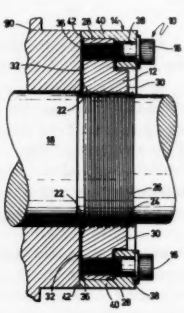
wherein a distance between said annular groove and said open end of said female member sleeve is slightly greater than a distance between said annular lip and said bottom surface of said male member flange.

5,069,587

SECURING NUT APPARATUS

Victor M. Levenstein, Reynoldsburg, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 13, 1990, Ser. No. 537,179
Int. Cl.[5] F16B *37/08;* B21D *39/00*
U.S. Cl. 411—432 8 Claims



1. A securing nut apparatus for detachably clamping a member on a shaft comprising:

A. a nut hub body having a threaded main bore detachably engageable to a threaded portion of the shaft, and a flange portion having a plurality of threaded holes in a spaced apart relationship;

B. a nut outer ring having a plurality of bores in alignment with said threaded holes of said nut hub body and an annular sidewall overlapping said flange portion of said nut hub body, said annular sidewall having an end face; and

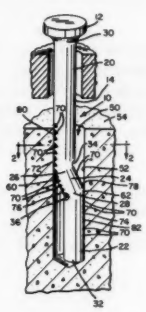
C. a plurality of screws receivable through said bores of said nut outer ring and threadedly engageable with said holes of said nut hub body so that said end face of said annular side wall abuts the member and applies a clamping force to the member onto the shaft.

5,069,588

ANCHORING DEVICE

Syed R. Hasan, Palatine; Mark A. Packard, Rockford, and Michael P. Ditka, Deerfield, all of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Filed Sep. 13, 1990, Ser. No. 581,806
Int. Cl.[5] F16B *15/00*
U.S. Cl. 411—439 10 Claims



1. An anchoring device, comprising:

a head; and

a shank integral with said head and adapted to be forcibly driven into a material within which said anchoring device si to be fixed;

said shank comprising two substantially straight leg portions disposed in substantially parallel planes with respect to each other when said shank is unstressed, said leg portions comprising a first longitudinal axis defined therealong, a second distal portion spaced from said proximal potion and having a second longitudinal axis defined therealong, and a transitional portion interconnecting said fist proximal and second distal portions together, said transitional portion being connected to said proximal portion by means of a proximal elbow portion, and being connected to said distal portion by means of a distal elbow portion, said proximal and sit al elbow portions including convex surface portions, and said proximal potion, said distal portion, said convex surface portion of said proximal elbow portion, and said convex surface portion of said distal elbow portion each being provided with notch means disposed transversely to said longitudinal axes of said proximal and distal portions or frictionally engaging sidewall portions of a bore defined within said material and into which said anchoring device is to be fixed.

5,069,589

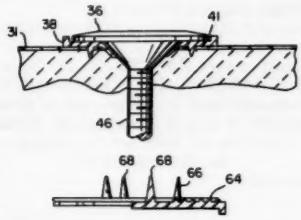
STRESS PLATE FOR ROOF MEMBRANE FASTENER ASSEMBLY

Stuart H. Lemke, 413 4th St., Mosinee, Wis. 54455

Continuation of Ser. No. 236,542, Feb. 25, 1988, abandoned. This application Dec. 15, 1989, Ser. No. 455,832

Int. Cl.[5] F16B *43/00*; E04B *7/00*

U.S. Cl. 411—533 17 Claims



1. A stress plate adapted for use with a fastener, which fastener has an elongated shank and an enlarged diameter head at one end of said shank, for securing a roof membrane to a roof deck, said plate having:

top and bottom surfaces,

a central hole configured to allow the fastener shank to fit therethrough but of lesser diameter than the fastener head;

a formation of upright, pointed teeth extending from said bottom surface; and

a series of non radial ribs extending from said bottom surface, which ribs are shorter than said teeth.

5,069,590

PROCESS FOR PRODUCING A TWO-CHAMBER PRESSURIZED PACKAGE

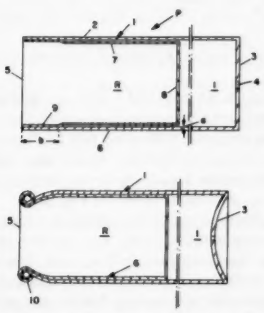
Gerd Stoffel, In den Dorfackern 21, D-7750 Konstanz, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 301,842, Jan. 25, 1989, abandoned. This application Oct. 26, 1990, Ser. No. 605,110

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1988, 3802314

Int. Cl.[5] B21D *51/26*

U.S. Cl. 413—1 11 Claims



1. Process for producing a two-chamber pressurized package which comprises: providing an outer body which encloses an interior space which can be subjected to pressure, said outer body having an opening therein suitable for receiving a cover and valve; inserting an inner body which can fold or be crumbled in the opening in the outer body and connecting the outer and inner bodies to each other in a pre-determined region to form a first chamber suitable for receiving a product and a second chamber suitable for receiving a pressurized gas; folding over a portion of the inner and outer bodies together to form a flanged edge consisting solely of the inner and outer bodies; wherein the connecting step takes place prior to the folding step and the folding step takes place prior to applying a cover and valve and prior to filling the first chamber.

5,069,591

SEMICONDUCTOR WAFER-PROCESSING APPARATUS

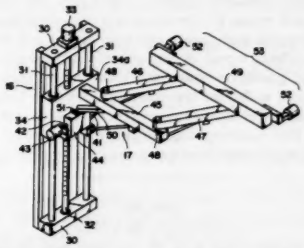
Kenichi Kinoshita, Machida, Japan, assignor to Tel Sagami Limited, Kanagawa, Japan

Filed Mar. 23, 1989, Ser. No. 328,096

Claims priority, application Japan, Mar. 24, 1988, 63-68187

Int. Cl.[5] F27D *5/00*

U.S. Cl. 414—156 6 Claims



1. A semiconductor wafer-processing apparatus which comprises:

a plurality of support members provided respectively for processing units of a processing apparatus, and designed for supporting wafer receptacles each containing semiconductor wafers;

receptacle-inserting/extracting means for inserting a wafer receptacle from the support members into the processing units, and for extracting the wafer receptacle from the processing units back to the support members; and

receptacle-inserting/extracting means, for transporting the wafer receptacle between each support member and a predetermined position;

wherein said receptacle-transporting means comprises a horizontal transport mechanism and an elevator mechanism for vertically moving the horizontal transport mechanism, said horizontal transport mechanism including a fixed arm, a horizontally movable arm extending parallel to the fixed arm and having means for supporting the wafer receptacle, and a pair of connecting arms connecting the fixed arm and the horizontally movable arm, forming a parallel link, wherein said wafer receptacle supporting means comprises movable holders movable toward, and away from, each other, to hold, and release, the wafer receptacle at both ends thereof.

5,069,592

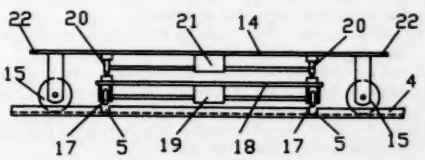
AUTOMATED MULTISTOREY PARKING BUILDING

Lev Galperin, 4950 St. Kevin, #18, Montreal, Canada H3W 1P4

Filed Mar. 13, 1990, Ser. No. 492,115

Int. Cl.[5] E04H *6/12*

U.S. Cl. 414—240 1 Claim



1. A multistory parking apparatus comprising: A multistory parking building consisting of columns, longitudinal and transverse elements for partitioning of the building into boxes for parking vehicles, lanes for horizontal vehicle distribution, and elevator pits; longitudinal guides in each lane and transverse

guides in each box, said longitudinal guides being perpendicular to said transverse guides; elevators located in said elevator pits and having longitudinal and transverse guides which align, respectively, with said longitudinal guides of each lane and said transverse guides of each box at appropriate levels; a platform located in each box, said platform having at least one guide track for vehicle wheels and two wheel fixing means located in said at least one guide track for preventing movement of vehicle wheels; and shuttle means for moving said platforms, said shuttle means comprising: two frames one of which is fitted with longitudinal wheel means for moving said shuttle in said longitudinal guides of each lane and another of which is fitted with transverse wheel means for moving said shuttle in said transverse guides of each box, said frames being joined by jack means for lowering said transverse wheel means into engagement with said transverse guides and thus raising said longitudinal wheel means out of engagement with said longitudinal guides or raising said transverse wheel means out of engagment with said transverse guides thus lowering said longitudinal wheel means into engagement with said longitudinal guides thus enabling said shuttle means to travel along said transverse or said longitudinal guides.

5,069,593

LIFTING DEVICE

Robert F. Zelinka, and John W. Redding, both of Roselle, Ill., assignors to Perkins Manufacturing Company, Chicago, Ill.

Continuation of Ser. No. 126,593, Nov. 30, 1987, Pat. No. 4,911,600, which is a continuation of Ser. No. 862,015, May 12, 1986, Pat. No. 4,741,658, which is a continuation of Ser. No. 572,389, Jan. 20, 1984, abandoned. This application Nov. 21, 1989, Ser. No. 439,858

The portion of the term of this patent subsequent to May 3, 2005, has been disclaimed.

Int. Cl.[5] B65F *3/02*

U.S. Cl. 414—408 **34 Claims**

1. Receptacle dumping apparatus attachable to a rear-loading refuse collection vehicle having a rearwardly opening refuse receiving cavity including side walls and a floor extending upwardly toward a rear sill having an edge, which vehicle is adapted for receiving refuse from relatively large rear-loading refuse containers of the type which are dumped into the refuse receiving cavity by tilting over the rear sill, said receptacle dumping apparatus being adapted to dump smaller refuse receptacles and being movable to a position where the dumping of the aforesaid larger containers is unobstructed, said receptacle dumping apparatus comprising:

a receptacle lifter which includes means for capturing and releasing a refuse receptacle;

means for pivotally mounting said receptacle lifter below the edge of the rear sill of a refuse collection vehicle, said lifter being pivotal in a fore and aft direction;

means for pivoting said receptacle lifter between a first lifter position and a second lifter position;

said first lifter position being located sufficiently below an imaginary horizontal plane through the sill edge and sufficiently on the cavity side of an imaginary vertical plane along the sill edge such that lateral access to the sill edge from opposite the cavity side of said vertical plane is substantially unobstructed and said receptacle lifter, when in said first position, does not interfere with the dumping of relatively large rear-loading refuse containers into the refuse receiving cavity;

said second lifter position being located above said horizontal plane for dumping refuse from the relatively smaller type of receptacle; and

means cooperatively associated with said lifter for moving said capture and release means between release and capture positions as said lifter moves between said first and second lifter positions.

5,069,594

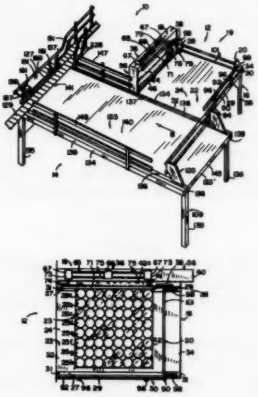
BOTTLE DEBAGGING AND FEEDING APPARATUS

Jerry A. Bott, and Floyd W. Butler, both of Grand Rapids, Mich., assignors to Ideas in Motion, Grand Rapids, Mich.

Filed May 15, 1990, Ser. No. 523,479

Int. Cl.[5] B65B *43/38*

U.S. Cl. 414—412 **47 Claims**



1. An apparatus for debagging and feeding items into a production stream, said apparatus comprising:

(a) a debagging system including:

(i) supporting means for supporting a collection of items encased within a bag having a sealed flap to close one end;

(ii) a pair of rollers positioned adjacent said supporting means;

(iii) means for driving said rollers in opposite directions such that said rollers direct the sealed flap on the bag to pass between said rollers and pull the flap to form a taut portion of the bag between said rollers and the items;

(iv) cutting means for cutting the bag between the flap and the items to thereby open the bag; and

(v) first coordinating means for sensing when the portion of the bag is substantially taut and for activating said cutting means to cut the bag, said first coordinating means including a sensing bar and a cooperating control unit, wherein said sensing bar is engaged and moved from a first position to a second position by the items when said rollers pull the flap of the bag to create tautness in the bag, and wherein said sensing bar in said second position functions to stop the movement of the items and cooperate with said control unit to activate said cutting means to cut the bag;

(b) a loading system including:

(i) a feed bed adapted to receive a plurality of items thereon;

(ii) take-off means for periodic movements for removing at least one row of items at a time from said feed bed;

(iii) moving means for periodic movements for moving the

items toward said take-off means so that the items can be thereby removed from said feed bed; and

(iv) coordinating means for sensing and controlling the periodic movements of said take-off means and said moving means; and

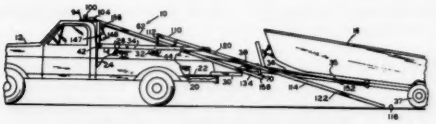
(c) transferring means for transferring the items from said supporting surface to said feed bed after the bag has been removed from the items.

5,069,595

LOADER AND CARRIER APPARATUS FOR BOAT AND TRAILER

Douglas J. Smith, 342 Osage Ave., and Paul D. Thompson, 1087 W. Pilger, both of Roseburg, Oreg. 97470

Filed Aug. 6, 1990, Ser. No. 562,795
Int. Cl.[5] B60P *3/10*
U.S. Cl. 414—462 **5 Claims**



1. A loader and carrier apparatus for boats and trailers, in combination with a boat trailer having two wheels and a tongue, and with a pickup truck with a cargo box having a floor, a fixed front wall, and two fixed side walls having a plurality of stake pockets located along the top thereof, the loader and carrier apparatus comprising:

a. a support framework including:

(1) two side rails members, each formed to lay atop and be supported by the side walls of the pickup truck cargo box, and to engage the stake pockets located therein, each side rail member having a front end and a rear end; and

(2) a front lower cross member, formed to lay atop and be supported by the front wall of the pickup truck cargo box, and attached at its two opposing ends to the front ends of said two side rail members;

b. a front framework, including:

(1) two front side members and a front center member, each having an upper end and a lower end, which are attached at their lower ends to the support framework at the front lower cross member and extend upwards therefrom; and

(2) a front top cross member, attached to the upper ends of the front side members and the front center member;

c. a first rear cross member and a second rear cross member, attached to and extending horizontally between the two side rail members, the first rear cross member being attached to the side rail members proximate their rear ends and the second rear cross member attached in a position spaced forward from and parallel to the fist rear cross member

d. a guide rail attached centrally to the fist rear cross member and extending upwardly and forward to a central attachment at the front top cross member;

e. a guide rail extension, formed to attach to, and longitudinally extend rearward and downward from the lower end of the guide rail;

f. a forward support platform attached to the guide rail at the junction of the guide rail and the front top cross member, and extending horizontally forward therefrom;

g. a first horizontal roller assembly mounted on the tongue of the trailer and extending downwards therefrom, said fist horizontal roller assembly formed and positioned to engage said guide rail extension, guide rail, and forward support platform, thereby supporting, upon said guide rail extension, guide rail and forward support platform, the tongue of the trailer while so engaged;

h. a second horizontal roller assembly, mounted upon the guide rail proximate its forward, upper end, which is formed and positioned to support the tongue o the trailer when the first horizontal roller assembly is into engaged upon the guide rail extension, guide rail, or forward support platform;

i. said forward support platform having a front end, extending horizontally forward, from the junction of the guide rail and the front top cross member, that distance whereat, when the first roller assembly disengages from said front end of the platform, the second roller assembly will engage the tongue of the trailer;

j. two wheel rest plates, positioned on supporting frames above, and supported by, the first and second rear cross members so as to provide support for the two wheel of the trailer when loaded upon the pickup truck;

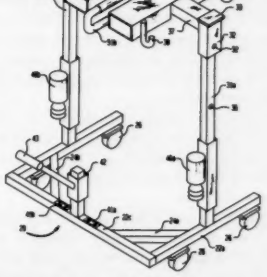
k. a pair of detachable ramp assemblies, extending longitudinally from the wheel rest plates to the ground; and 'l. a winch assembly.

5,069,596

BULK BAG HANDLING AND DISCHARGING APPARATUS

Hermann Mueller, Lindenhurst; Timothy J. Hendron, Naperville, and David Dawood, Chicago, all of Ill., assignors to Lawter International, Inc., Northbrook, Ill.

Filed Jul. 10, 1990, Ser. No. 550,409
Int. Cl.[5] B65D *33/38;* B57B *7/26;* B66F *9/00*
U.S. Cl. 414—607 **15 Claims**



1. A bulk bag handling and discharging apparatus to be used in conjunction with an external hoist means having at least one tyne, comprising:

a generally horizontally-oriented base frame mounted on casters;

a vertically-oriented support frame rigidly connected to the base frame;

a cross-beam slideably mounted on the vertical support frame for vertical movement between an upper fixed position and a lower fixed position;

a mechanical stop at the upper end of the vertical support frame which limits the upward travel of the cross-beam, thereby enabling the entire apparatus to be lifted by a vertical force applied to the cross-beam by said hoist means;

means for locking the cross-beam in both said upper and lower fixed positions, the locking means preventing further vertical travel of the cross-beam with respect to said vertical support frame from the upper and lower fixed positions;

a bag hanger mounted on the cross-beam upon which may be hung a bulk bag; and

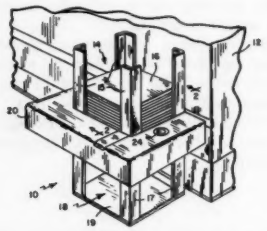
receiving means including the cross-beam for receiving the tynes of said hoist means.

5,069,597

AUTOMATICALLY LOADING AND UNLOADING MECHANISM FOR FLAT REMOVABLE STORAGE ELEMENTS

Louis J. Doctor, 815 North Rd., Carlisle, Mass. 01741

Filed Jan. 16, 1990, Ser. No. 464,961
Int. Cl.[5] B65G *59/06*
U.S. Cl. 414—788.7 **18 Claims**



1. An automatic loading and unloading mechanism for a flat removable storage element drive device, said drive device having an element receiving slot and providing a predetermined indication when a storage element is to be unloaded, comprising:

means for holding elements to be loaded and for holding unloaded elements;

a slide assembly positioned between he elements to be loaded and the unloaded elements and in alignment with said receiving slot;

an engaging mechanism mounted to move with said slide assembly;

means responsive to said predetermined indication for both moving said slide assembly in a direction generally perpendicular to and away from said slot and or causing said engaging mechanism to engage the element to be unloaded, said element moving with said slide assembly to be unloaded form said slot;

first means operative when said element is unloaded from said slot for both moving said element into the means for holding unloaded elements and for moving the bottom element to be loaded into alignment with the slide assembly and the slot; and

second means operative when aid bottom element is in said alignment for moving said slide assembly in a direction generally perpendicular and toward said slot and to push said bottom element ahead of said slide assembly into said slot.

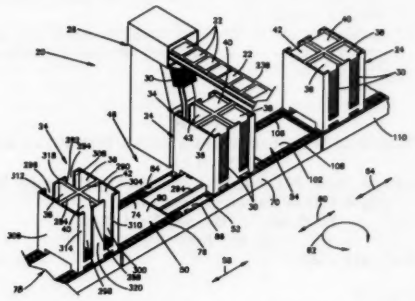
5,069,598

APPARATUS AND METHOD FOR LOADING SHEET MATERIAL ARTICLES

Stephen R. Kleinhen, Eaton, and Robert A. Bryson, Sr., Huber Hts., both of Ohio, assignors to AM International Incorporated, Chicago, Ill.

Continuation-in-part of Ser. No. 261,394, Oct. 24, 1988, abandoned. This application Aug. 13, 1990, Ser. No. 566,616
Int. Cl.[5] B65G *57/00*
U.S. Cl. 414—790 **80 Claims**

30. An apparatus for use in sequentially handling containers having compartments for sheet material articles, said apparatus comprising sheet material handling means for moving sheet material relative to compartments of the containers when the containers are at a work station, carriage means for engaging a bottom portion of each of the containers in turn to support each of the containers at the work station, first shuttle means disposed adjacent to a first side of said carriage means for sequentially transferring containers to said carriage means, and second shuttle means disposed adjacent a second side of said carriage means for sequentially transferring containers from said carriage means, said carriage means including means for rotating a container disposed on said carriage means about a



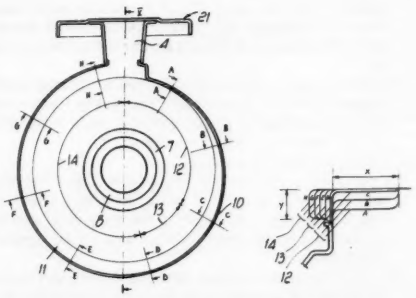
vertical axis to change the orientation of the container relative to said sheet material handling means.

5,069,599

METAL PLATE STATOR CASE, PARTICULARLY FOR RADIAL CENTRIFUGAL PUMPS

Tiziano Carretta, Grumolo Delle Abbadesse, Italy, assignor to Ebara Corporation, Tokyo, Japan

Filed Jul. 26, 1990, Ser. No. 558,585
Claims priority, application Italy, Aug. 18, 1989, 85635 A/89
Int. Cl.[5] F01D *1/00, 9/00;* **F03B** *1/00;* **F04D** *1/00*
U.S. Cl. 415—182.1 **11 Claims**



1. Metal plate stator case, particularly for radial centrifugal pumps, comprising a main body, which defines a lateral wall and a front wall, a diffusion volute, an axial suction inlet and a radial discharge outlet at the output of said diffusion volute, said volute being constituted by a circumferential channel which is defined in the lateral wall of said main body and has a radial transverse cross section which rises uniformly toward the output of said volute, at least one portion of said channel having, in said transverse cross section, a substantially constant radial depth and an axial width which increases uniformly toward the output of said volute.

5,069,600

PRESSURE WAVE MACHINE

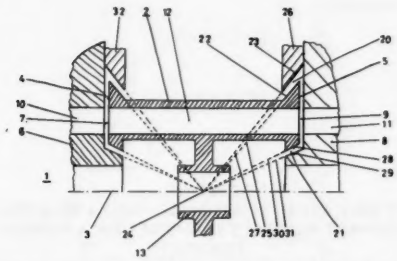
Rolf Althaus, St. Gallen, and Erwin Zauner, Baden, both of Switzerland, assignors to Asea Brown Boveri Ltd., Baden, Switzerland

Filed Nov. 29, 1990, Ser. No. 619,425
Claims priority, application Switzerland, Dec. 6, 1989, 4374/89
Int. Cl.[5] F04F *11/00*
U.S. Cl. 417—64 **22 Claims**

1. Pressure wave machine (**1**) with a cell wheel (**2**) which has

a longitudinal axis (3) and is supported by means of a bearing in a casing, one end face (4) of which cell wheel interacting with a hot gas guidance casing (6) by means of a first radially directed sealing gap (7) and its other end face (5) interacting with a gas guidance casing (8) by means of a second radially directed sealing gap (9), wherein

at least one of the radially directed sealing gaps (7, 9) has at



least one gap extension (20) inclined relative to the longitudinal axis (3) and having two flanks (22, 23)

both the flank (22) on the cell wheel end and the flank (23) opposite to it on the casing end of the at least one gap extension (20) are respectively located on the generated surface of a cone, and

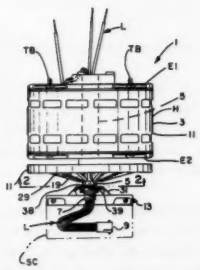
each of these two cones has an apex on the longitudinal axis (3) inside the cell wheel (2).

5,069,601

CEILING FAN WITH REMOVABLE HUB

James P. Shawcross, Chesterfield, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 18, 1990, Ser. No. 467,138
Int. Cl.[5] F04D *29/60*
U.S. Cl. 417—360 **9 Claims**



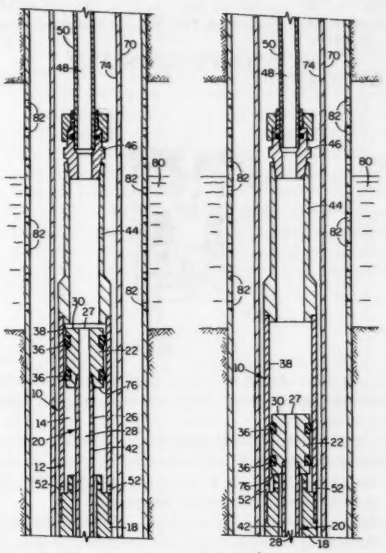
1. In a ceiling fan including a motor, a hollow motor shaft driven by the motor, a non-rotating wire-way tube within said motor shaft carrying wires, a receptacle connected to said wires, an elastomeric hub carried by said motor shaft and rotatable therewith, and a switch housing adapter connected to said wire-way tube, wherein the improvement comprises: said hub having an opening for receiving said motor shaft, and means for removably connecting said hub to said motor shaft for permitting of removal of said hub, said adapter having an opening therethrough for receiving said wire-way tube, securement hardware for removably securing said adapter to said wire-way tube, said openings in said hub and in said adapter being configured to fit over said securement hardware and over said receptacle thereby to permit removal of said adaptor and said hub without removing said receptacle from said wires.

5,069,602

FLUID-POWERED SUBSURFACE PUMP

Thomas C. Gipson, P.O. Box 231, 1-20 East, Cisco, Tex. 76437

Filed Sep. 26, 1990, Ser. No. 588,562
Int. Cl.[5] F04B *17/00, 35/00*
U.S. Cl. 417—399 **1 Claim**



1. A fluid-powered pump for attachment to small diametered coiled tubing for pumping subsurface liquid from a well production tube comprising:

a pump housing having an upper end and a lower end, said upper end releasably attachable to a downhole end of said coiled tubing, the inside of said upper end of said housing in fluid communication with the inside of said coiled tubing;

a cross head seal member dividing said pump into an upper chamber and a lower chamber, said upper chamber in fluid communication with said inside of said coiled tubing;

a pump actuator extending between said upper and lower chambers, said actuator having an upper piston head sealingly fitted to reciprocate in said upper chamber and a lower piston head sealingly fitted to reciprocate in said lower chamber, said upper piston head and said lower piston head connected to each other by a connector rod sealing slidable in said cross head seal member, said actuator having a conduit for fluid communication between said upper chamber and said lower chamber, said conduit extending from an orifice in the top surface of said upper piston head, through said connector rod to a port above the top surface of said lower piston head;

an inlet valve in said housing for allowing said subsurface liquid to selectively enter said lower chamber when said actuator is moved from a second position to a first position;

an outlet valve in said housing for allowing said subsurface liquid to selectively exit said lower chamber when said actuator is moved from said first position to said second position; and

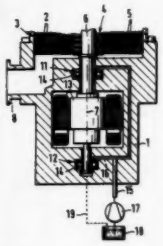
a piston return port in said housing beneath said upper piston head and above said cross head seal member for fluid communication between said upper chamber and the exterior of said housing.

5,069,603

BEARINGS FOR USE IN NEGATIVE-PRESSURE ENVIRONMENTS

Guenter Schuetz; Hans-Guenter Stueber, both of Koeln, and Volker Kinzig, Geinhausen, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 396,514, Aug. 21, 1989, Pat. No. 5,028,219. This application Apr. 22, 1991, Ser. No. 688,840
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1989, 3926577
Int. Cl.[5] F04B *39/02*; F16C *33/62*
U.S. Cl. 417—423.4 6 Claims



1. A vacuum pump of the type including a rotor and at least one bearing supporting said rotor, said vacuum pump comprising the following:

said at least one bearing including a plurality of ceramic rolling members, an inside bearing ring, and an outside bearing ring located in an environment subject to negative pressure during operation of aid pump;

means for supplying lubricant to aid at least one bearing and establishing a lubricant film between said rolling members and said bearing rings;

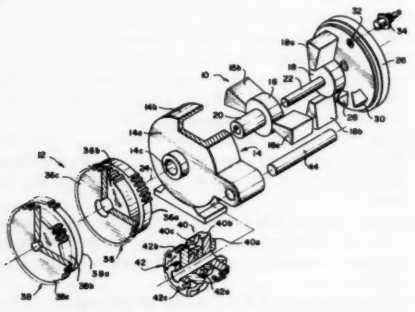
setting means including at least one setting sleeve axially reciprocable in a housing a compression spring biasing said at least one setting sleeve at least one cap closing said housing, and lubricant reservoir means, within said setting means for supplying lubricant to aid at lest one bearing.

5,069,604

RADIAL PISTON ROTARY DEVICE AND DRIVE MECHANISM

Adel K. Al-Sabih, Post Office Box 1366 (Safat), Kuwait, Kuwait 13014

Filed Jun. 1, 1989, Ser. No. 360,074
Int. Cl.[5] F01C *1/077*
U.S. Cl. 418—36 15 Claims



1. A mechanism for synchronizing the rotation of a pair of gear wheels having pairs of inter-engaging teeth on only a portion of their peripheries comprising:

a) a pin or roller means extending from each of the gear wheels; and,

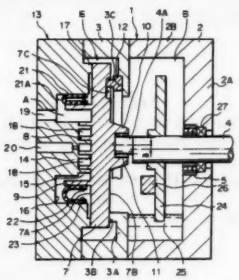
b) a synchronizing slot defined by each of the gear wheels generally diametrically opposite the respective pin such that engagement of the pin and the synchronizing slot provides the sole driving connection between the gear wheels between disengagement of one pair of gear teeth segments and engagement of the next pair of gear teeth segments.

5,069,605

SCROLL FLUID MACHINE HAVING A SEALING MEMBER RADIALLY INWARDLY OF A THRUST BEARING

Takashi Saitoh, and Kohji Fukui, both of Kanagawa, Japan, assignors to Tokico Ltd., Kanagawa, Japan

Filed Mar. 14, 1990, Ser. No. 493,152
Claims priority, application Japan, Mar. 20, 1989, 1-69024
Int. Cl.[5] F01C *1/04, 19/00*
U.S. Cl. 418—55.2 4 Claims



1. A scroll fluid machine comprising:

a casing;

a drive shaft journaled on the casing for rotation and having an eccentric shaft portion extending within the casing;

a scroll rotor supported through a bearing on the eccentric portion of the drive shaft, and having a base plate and a scroll wrap projecting from one major surface of the base plate;

a scroll stator fixedly attached to the casing, and having a base plate provided with a suction port in its peripheral portion and a discharge port in its central portion and a scroll wrap projecting from the base plate and defining a closed space together with the scroll wrap of the scroll rotor;

wherein thrust bearing portions are formed at peripheral portions of the scroll stator and the scroll rotor, respectively, to sustain thrusts acting on the scroll rotor, said thrust bearing portions being located on the radially outer portions of the stator and rotor, respectively, and a sealing member is provided in a space defined between and by the scroll rotor and the scroll stator and communicating with the suction port, said sealing member being located radially inwardly of the thrust bearing portions; and

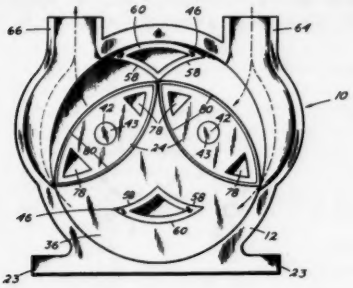
wherein said scroll rotor is provided with a cylindrical wall extending from said one major surface of the base plate thereof, and wherein said sealing member includes inner and outer lip portions, said inner lip portion being secured onto said cylindrical wall.

5,069,606

ROTARY FLUID DISPLACEMENT APPARATUS

John R. Bachellerie, 2150 Forbestown Rd., Oroville, Calif. 95966

Filed Oct. 15, 1990, Ser. No. 597,531
Int. Cl.[5] F04C 1/16
U.S. Cl. 418—58 6 Claims



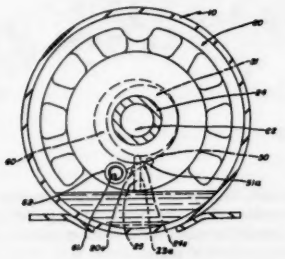
1. A rotary fluid displacement apparatus comprising a chamber containing two rotatable blades, each said blade having a cross-sectional profile approximating opposing generally equal larger radius 90 degree arcs connected by opposing generally equal smaller radius 90 degree arcs, each said rotatable blade positioned with a cross-sectional longitudinal axis of one said blade affixed and maintained generally perpendicular to a cross-sectional longitudinal axis of the other said blade, a portion of each said blade further maintained in at least a close proximity to contacting the other said blade, a portion of each said blade further positioned in at least a close proximity to contacting an interior annular wall partially bounding said chamber, said apparatus having means to rotate said blades within said chamber to form expanding and contracting subchambers within said chamber, at least one fluid input port into said chamber, and at least one fluid output port into said chamber.

5,069,607

ROTARY ROLLING PISTON TYPE COMPRESSOR

Caio M. F. N. Da Costa, Joinville, Brazil, assignor to Empresa Brasileira de Compressores S/A -Embraco, Joinville, Brazil

Filed Jun. 9, 1989, Ser. No. 364,376
Claims priority, application Brazil, Jun. 9, 1988, PI8802894
Int. Cl.[5] F04C 18/00
U.S. Cl. 418—63 3 Claims



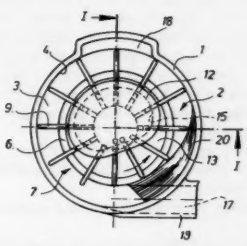
1. A rotary piston compressor comprising:
a housing,
an annular cylinder mounted in said housing,
an eccentric piston rotating within said cylinder,
a crankshaft in aid housing supported by a spaced apart main bearing and a sub-bearing one on each side of said cylinder for rotating said piston which rotates in the space between the opposed faces of said main bearing and sub-bearing,
a radial slot formed in the cylinder wall,
a reciprocating vane disposed in said slot between the opposing faces of said main bearing and said sub-bearing,
means for biasing said vane so that an end contacts the piston to be reciprocated thereby as the piston rotates, said vane defining with the interior of the cylinder and the surfaces of said main bearing and sub-bearing on one side a compression chamber and on the other side a suction chamber,
one of said bearing shaving a discharge orifice in communication with said compression chamber and also having on its internal face an elongated groove or channel extending at an angel to the plane of the reciprocating vane with one end of the groove communicating with the pressure of said compression chamber at a point adjacent said discharge orifice and a part of the groove extending to the suction chamber side of the vane, and said cylinder having a recess communicating with said part of the groove on the suction chamber side and the slot for applying the pressure from the compression chamber as discharged to the orifice to the face of the vane along the suction chamber side to act to balance the pressure on the two sides of the vane.

5,069,608

VANE PUMP FOR DELIVERING PASTY SUBSTANCES

Siegfried Räther, Bad Segeberg, Fed. Rep. of Germany, assignor to Nordischer Maschinenbau Rud. Baader Gmbh & Co Kg, Lubeck, Fed. Rep. of Germany

Filed Apr. 26, 1989, Ser. No. 343,283
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1988, 8805548[U]
Int. Cl.[5] A22C 11/08; A04C 2/00
U.S. Cl. 418—261 2 Claims



1. A vane pump for delivering pasty materials, particularly sausage stuffing to product portions of at least one of even weight and even volume of said material, the vane pump comprising:
a) a casing,
b) a pump chamber surrounded by said casing defined by a radial inner wall, and closed by two axial boundary faces,
c) a pump rotor mounted in casing and driven to rotate therein about an axis of rotation,
d) plate-like slide means guided to be displaced in said casing radially relative to said axis of rotation and constructed so as to engage in sealingly sliding manner on said axial boundary faces formed in said pump chamber, said slide means, over at least part of one revolution of said pump rotor, contacting said radial inner wall of said pump chamber,
e) an inlet and an outlet, both arranged in said casing, with said inlet being arranged in one of said axial boundary faces in the region of a path of revolution of said slide means so as to enable a supplying of the pasty material to said chamber substantially in a direction parallel to said axis of rotation, and
f) a transition area formed between at least one of said axial

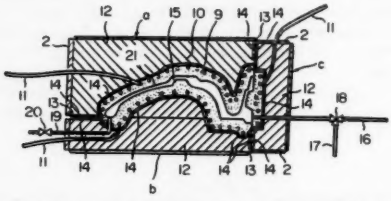
boundary faces and said radial inner wall in the shape of a curve.

5,069,609

MOLD USED IN PRESSURE CASTING CERAMIC ARTICLES

Haruyuki Ito, and Akio Matsumoto, both of Fukuoka, Japan, assignors to Toto Ltd., Kitakyushu, Japan

Continuation-in-part of Ser. No. 77,655, Jul. 24, 1987, Pat. No. 4,884,959. This application Nov. 16, 1989, Ser. No. 437,399
Claims priority, application Japan, Jul. 26, 1986, 61-176369
The portion of the term of this patent subsequent to Dec. 5, 2006, has been disclaimed.
Int. Cl.[5] B28B *1/26*; B29C *41/16*
U.S. Cl. 425—84 **11 Claims**



1. A mold for use in pressure slip casting ceramic articles, said mold comprising:

a plurality of mold parts set and clamped in combination under a clamping pressure and each mold part including:

a porous body having a low strength forming a filter layer with a generally even thickness and a plurality of channels formed therethrough for removing through the porous body water of the slip in a molding cavity formed between interior surfaces of said mold parts by clamping together said mold parts and for injecting compressed air through the porous body toward a molded product during a demolding step and for evacuating air through the porous body so as to attract the molded product to said mold parts, with a majority of said plurality of channels running parallel with a molding surface of said mold for allowing water and air to flow therethrough;

a resin layer applied to exterior surfaces of said porous body for preventing leakage of air and water from said porous body;

a reinforcing frame for fitting said porous body therein; and

a filler having a high compression strength relative to said porous body filling up the space between said resin layer on said porous body and said frame and for bearing the clamping pressure,

parting faces of said mold parts being covered by said resin layer and contacting each other and having a major portion of said parting faces being supported by said filler to prevent slip under pressure from leaking from said molding cavity under the clamping pressure, and

at least one of said mold parts including means for feeding slip into said molding cavity.

5,069,610

DRYWALL FINISHING TOOL ADAPTER

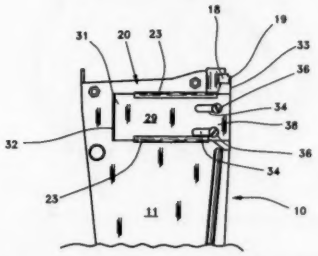
Virgil E. Milburn, P.O. Box 90998, Las Vegas, Nev. 89009

Filed Oct. 9, 1990, Ser. No. 595,174
Int. Cl.[5] B05C *5/02*
U.S. Cl. 425—87 **8 Claims**

1. An adapter for attachment to a mastic applicator and finishing tool flat box for controlling the application of a layer of mastic on wallboard adjacent a corner bead, the adapter comprising:

(a) a guide plate and an outside corner guide slidably mounted on the guide plate, and means for fixedly fastening the guide plate to a corner end of a sidewall of the flat box adjacent an end of a bottom wall of the flat box having an outlet through which mastic is dispensed; and

(b) the outside corner guide being slidably retained on the guide plate for movement on the guide plate between a retracted position and an extended position by overlying portions of the means for fastening the guide plate to the corner end of a sidewall of the flat box, the outside corner guide having a first end portion and a second end portion, the outside corner guide first end portion in retracted



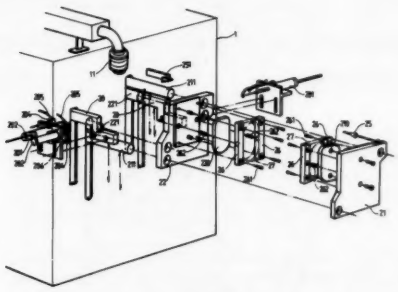
position of the corner guide on the guide plate inoperatively overlies said guide plate, and the outside corner guide first end portion in extended position of the corner guide on the guide plate being positionable to overlie the outside of a corner bead, whereby the movement of a flat box along the corner bead can be guided to limit the application of the mastic to the wallboard to filling the corner bead, the guide plate having a lateral depending end flange portion positioned to provide a friction wear shoe beneath the corner guide.

5,069,611

VERTICALLY-MOVABLE BLOW MOLDING APPARATUS

Ing-Chung Huang, No. 15 Reh-Her 1st Street, Kaohsiung, Taiwan, China

Filed Feb. 20, 1990, Ser. No. 481,908
Int. Cl.[5] B29C *49/04*
U.S. Cl. 425—90 **16 Claims**



1. A vertically-aligned blow molding apparatus for producing hollow molded plastic products, said apparatus comprising:

(a) an overhead extruder for extruding tubular plastic material along a vertical path;

(b) a mold assembly below the extruder and reciprocatably movable along the vertical path between an upper loading position and a lower discharge position, said mold assembly including

(i) a pair of molds reciprocatably displaceable along a horizontal path generally perpendicular to the vertical path toward and away from each other, said molds

being initially spaced apart from each other in the upper loading position to receive the tubular plastic material between the spaced-apart molds, said molds thereupon contacting each other in the upper loading position and having inner surfaces bounding an interior mold cavity to shape the tubular plastic material into a hollow molded plastic product, said mold cavity having a periphery,

(ii) means movable with the mold assembly for sealing the periphery of the mold cavity in the upper loading position, and for maintaining the mold cavity sealed during movement of the mold assembly to the lower discharge position,

(iii) means movable with the mold assembly for injecting air into the tubular plastic material to inflate the hollow molded plastic product when the mold assembly is in the upper loading position,

(iv) means movable with the mold assembly for discharging the hollow molded plastic product from the mold cavity in the lower discharge position, and

(v) means movable with the mold assembly for coating the mold cavity with a release agent after discharge of the hollow molded plastic product; and

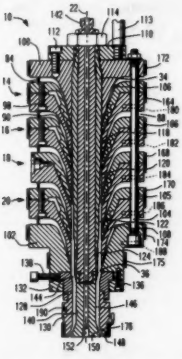
(c) a conveyor having an entry zone in the vertical path below the mold assembly, for conveying the hollow molded plastic product away from the mold assembly.

5,069,612

MODULAR TUBULAR EXTRUSION HEAD

Erich O. Teutsch, Pittsfield, Mass., and Dennis J. Coyle, Clifton Park, N.Y., assignors to General Electric Corporation, Pittsfield, Mass.

Filed Sep. 20, 1990, Ser. No. 585,452
Int. Cl.[5] B29C *47/06, 47/12*
U.S. Cl. 425—133.1 **18 Claims**



1. A polymer resin extrusion head for extruding tubular articles, comprising:

one or more annular extrusion modules disposed along an axis of the module or modules;

upper and lower clamp members being disposed on opposite sides of the extrusion module or modules along the axis;

means securing the annular extrusion module or modules between the upper and lower clamp members;

said extrusion module or each module having a pair of mating coaxial annular members, and means securing the pair of mating annular members together;

said pair of mating annular members defining a resin inlet on the periphery of the module, a coaxial bore having an inner cylindrical surface, an annular extrusion outlet opening into said inner cylindrical surface of the bore, and channel means formed on mating surface of the annular members for receiving and distributing resin from the inlet to the outlet;

said pair of mating members having inner and outer nested frustoconical portions, respectively, with the outlet being defined by adjacent mating inner and outer surfaces of said inner and outer frustoconical portions which form an annular space between the frustoconical portions;

said inner frustoconical portion having an inside surface with a greater angle from the axis than the angle of an outside surface of the outer frustoconical portion;

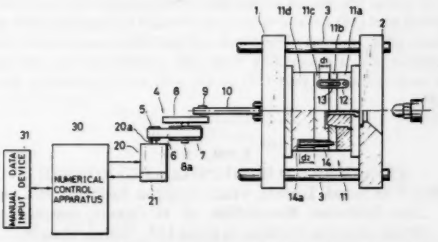
said upper and lower clamp members having respective convex and concave frustoconical surfaces with angles less than and greater than, respectively, the inside surface of the inner frustoconical portion and the outside surface of the outer frustoconical portion so that the apex of the convex frustoconical surface of the upper clamp member abuts the inside surface of the inner frustoconical portion of the module or the uppermost module and the outside surface of the apex of the outer frustoconical portion of the outer frustoconical portion of the module or the lowermost module abuts the concave frustoconical surface of the lower clamp member to form air spaces between the module or modules and the upper and lower clamp members including frustoconical air space portions.

5,069,613

CRANK TYPE MOLD CLAMPING APPARATUS WITH VARIABLE STROKE

Yoshiharu Inaba, Kawasaki, and Masao Kamiguchi, Oshino, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

PCT No. PCT/JP88/00635, § 371 Date Apr. 13, 1989, § 102(e) Date Apr. 13, 1989, PCT Pub. No. WO89/12541, PCT Pub. Date Dec. 28, 1989
PCT Filed Jun. 25, 1988, Ser. No. 343,146
Int. Cl.[5] B29C *45/80*
U.S. Cl. 425—150 **6 Claims**



1. A crank mold clamping apparatus having a mold-opening stroke whose length is variable, comprising:

a crank disposed for rotation;

a coupling member coupling said crank and a movable platen;

means coupled to said crank for driving said crank in a forward and reverse rotational direction;

means for variably setting the length of the mold-opening stroke; and

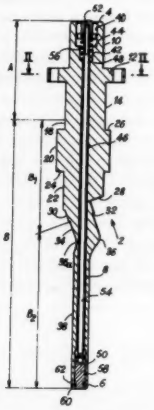
means for controlling said driving means so that said crank is rotated forwardly and reversely within a limited rotational angular region corresponding to the length of the mold-opening stroke.

5,069,614

CORE ROD FOR THE INJECTION BLOW-MOULDING OF A BOTTLE WITH AN INCLINED NECK

Pierre Belmont, Arques la Bataille, France, assignor to Kerplas S.N.C., Cedex, France

Filed May 16, 1990, Ser. No. 524,058
Int. Cl.[5] B29C *49/06*
U.S. Cl. 425—525 **4 Claims**



1. A core rod **(2)** for producing a plastic bottle by injection blow-moulding, said bottle having a neck inclined relative to the axis of the body of the bottle, the core rod comprising a first part (A) for mounting on an injection blow-moulding machine, extended by a second part (B), capable of being positioned inside a cavity of a mould and comprising a first section (B_1) which, when in position, is in contact with a first wall part of the mould cavity, and a second section (B_2) extending the first section and, when in position, surrounded with play by a second wall part of the mould cavity, there passing through the first (A) and second (B) parts of the core rod a straight axial blowing conduit **(8)**, of which a connecting end opens out onto an end face **(4)** of the first mounting part (A) and a blowing end **(6)** which opens out at the free end of the core rod, wherein the said first section (B_1) comprises a cylindrical stage **(30)** inclined relative to the axis of the conduit **(8)**, and in that the second section (B_2) comprises an inclined cylindrical part **(34)** coaxial relative to the said inclined cylindrical stage **(30)**, an axial cylindrical end part **(38)** coaxial with the conduit and a connecting zone **(36)** connecting the said inclined cylindrical part **(34)** to the said axial cylindrical part **(38)**.

5,069,615

STACK MOLD WITH INSULATED RUNNER

Robert D. Schad, Toronto; Vitaly Akselrud, Richmond Hill, and John DiSimone, Woodbridge, all of Canada, assignors to Husky Injection Molding Systems Ltd., Bolton, Canada

Filed Sep. 4, 1990, Ser. No. 577,262
Int. Cl.[5] B29C *45/40*
U.S. Cl. 425—556 **15 Claims**

1. An injection molding apparatus for forming plastic articles, said apparatus comprising:

a first mold portion, a second mold portion and a third mold portion intermediate said first and second mold portions;

said first, second and third mold portions being relatively movable along a first axis between mold open and mold closed positions;

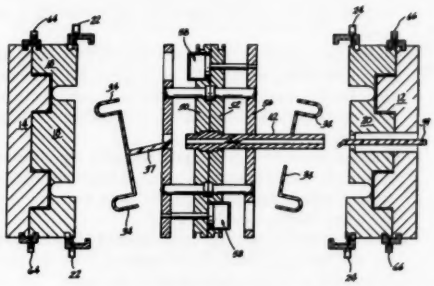
said first mold portion having a first mold plate;

said second mold portion having a second mold plate;

said third mold portion having third and fourth mold plates;

said first and third mold plates defining at least one mold space and said second and fourth mold plates defining at least one other mold space;

means for supplying molten plastic material to said mold spaces;



said plastic material supplying means including an insulated mold runner system which allows molten plastic material within said runner system to remain molten between molding cycles; and

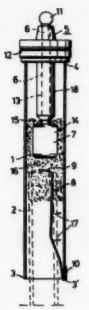
means for ejecting said runner system in a direction substantially parallel to said first axis.

5,069,616

IGNITION DEVICE FOR LANCES

Arne Larsson, Stockholm, Sweden, assignor to Oxy-Tuben AB, Hofors, Sweden

PCT No. PCT/SE88/00603, § 371 Date May 8, 1990, § 102(e) Date May 8, 1990, PCT Pub. No. WO89/04417, PCT Pub. Date May 18, 1989
PCT Filed Nov. 10, 1988, Ser. No. 488,018
Claims priority, application Sweden, Nov. 12, 1987, 8704421
Int. Cl.[5] F23Q *1/00*
U.S. Cl. 431—267 **13 Claims**



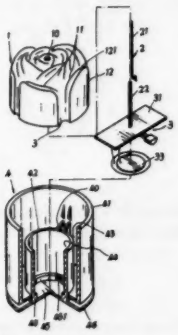
1. An ignition device for use with lances for supplying oxygen gas to metallurgical processes, said device comprising: a tubular casing having an open end to be fitted over and partially onto one end of a lance, the other end of said casing which will face away from the lance includes a striker, a pyrotechnical delay which extends into the casing, and a reaction mass located in the casing adjacent to and ignitable by said pyrotechnical delay which is ignited by said striker, and further including an end stop **9** fixed to the casing **(1)** inside of and at a location intermediate its ends and adjacent said reaction mass **(7)**; said end stop **(9)** being fixed to said casing against movement toward said other end thereby providing a stop against which the one end **(2)** of the lance, over which the casing is fitted, will abut.

5,069,617

WAX-ACCUMULATED MUSICAL CANDLE

Wen-Tsung Lin, P.O. Box 74-9, Taipei, Taiwan

Filed Jun. 6, 1991, Ser. No. 712,142
Int. Cl.[5] F23D 3/16
U.S. Cl. 431—253 5 Claims



1. A musical candle comprising:

a candle having a wick means longitudinally formed in said candle, a musical integrated circuit secured with the candle operatively actuated by a burning of said wick means, and a holder casing for mounting said candle and said musical integrated circuit in said casing;

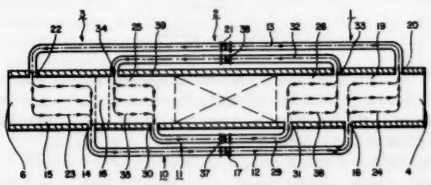
said candle having means for draining a molten wax or oil when burning the candle into a wax accumulator formed in said casing, thereby preventing an oil leakage or contamination of the molten wax from the candle towards a table surface.

5,069,618

METHOD AND KILN FOR FIRING CERAMIC ARTICLES

Jean-Louis Nieberding, Frepert 82, B-4729 Hauset, Belgium

Filed Apr. 26, 1990, Ser. No. 514,705
Claims priority, application Fed. Rep. of Germany, Apr. 27, 1989, 3913887; Jul. 7, 1989, 3918585
Int. Cl.[5] F27B 9/00
U.S. Cl. 432—137 13 Claims



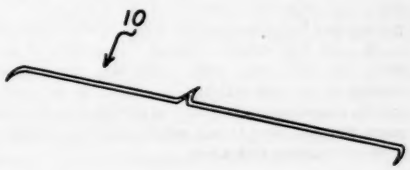
1. A method of firing ceramic articles in a through-type kiln defining aligned successive preheating, firing, and cooling zones, said cooling zone including a crystal transition region intermediately along the cooling zone generally defining a relatively cooler section of the cooling zone downstream of the crystal transition region in the direction of conveyance of the ceramic articles and a relatively warmer section of the cooling zone upstream of the crystal transition region, and said preheating zone having a relatively cooler entrance section spaced upstream from the firing zone and a relatively warmer downstream heating section adjacent the firing zone, the method comprising the steps of conveying ceramic articles to be fired in sequence through the preheating, firing and cooling zones of the kiln, and cooling the ceramic articles in the cooling zone with relatively cooler air and heating the ceramic articles in the preheating zone with relatively warmer air while essentially isolating the firing zone of the kiln from substantial flow of air therethrough between the preheating and cooling zones without structural separation of the preheating, firing and cooling zones without structural separation of the preheating, firing and cooling zones by directing air to flow through at least a portion of the cooling zone in heat exchange relation with the ceramic articles for cooling thereof, then directing the air to flow outside the firing zone, and then directing the air to flow through at least a portion of the preheating zone and heat exchange relation with the ceramic articles for heating thereof, said directing steps including circulating air in a first air circuit between the cooling and preheating zones by withdrawing air from the relatively cooler downstream section of the cooling zone and directing the withdrawn air outside the firing zone and into the relatively cooler upstream entrance section of the preheating zone while withdrawing air from the relatively cooler upstream entrance section of the preheating zone and directing any withdrawn air outside the firing zone and into the relatively cooler downstream section of the cooling zone, and simultaneously circulating air in a second air circuit between the cooling and preheating zones by withdrawing air from the relatively warmer upstream section of the cooling zone and directing the withdrawn air outside the firing zone and into the relatively warmer downstream heating section of the preheating zone while withdrawing air from the relatively warmer downstream heating section of the preheating zone and directing the withdrawn air outside the firing zone and into the relatively warmer upstream section of the cooling zone.

5,069,619

DENTAL IMPRESSION TRAY WITH LEVEL INDICATOR

Michael G. Frisbie, 1992 Millville Ct., Thousand Oaks, Calif. 91360

Filed Oct. 23, 1989, Ser. No. 425,125
Int. Cl.[5] A61C 19/04, 9/00
U.S. Cl. 433—72 19 Claims



1. In combination:

bite registration means adapted to be inserted into the mouth of a patient between the upper and lower patient teeth to extend when contacted by the upper and lower patient teeth generally along an approximate horizontal plane extending transversely through the patient's mouth and along the patient's bite line; and

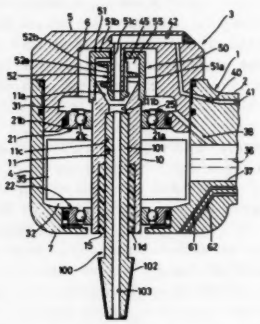
level indicator means mounted on said bite registration means at a position directly in front of the patient's mouth when said bite registration means is contacted by the upper and lower patient teeth to extend generally along said proximate horizontal plane for referencing deviations of said approximate horizontal plane from a true horizontal orientation and thereby reference the angle of the patient's bite line.

5,069,620

DENTAL HANDPIECE

Kanji Matsutani, Tochigi, and Masatoshi Fukuda, Utsunomiya, both of Japan, assignors to Matsutani Seisakusho Co., Ltd., Tochigi, Japan

Filed Apr. 25, 1991, Ser. No. 691,398
Claims priority, application Japan, May 1, 1990, 2-111737
Int. Cl.[5] A61C 1/12
U.S. Cl. 433—82 3 Claims



1. a dental handpiece for supporting a dental burr, said dental burr including a shank and a grinding portion extending from a distal end of said shank, said dental burr having an auxiliary coolant passageway extending along an axis of said dental burr, one end of said auxiliary coolant passageway being open to a proximal end of said shank whereas the other end thereof is open to an outer surface of said grinding portion, said dental handpiece comprising:

(a) a body including an arm, and a hollow head formed on a distal end of said arm, said head having a nozzle extending from an inner surface thereof, and said body having a main coolant passageway which extends in a longitudinal direction of said arm and is connected and its distal end to said nozzle;

(b) holder means of a generally cylindrical shape rotatably supported within said head of said body through bearing means, said shank of said dental burr being adapted to be inserted in and supported by said holder means, said holder means and said dental burr being disposed coaxially with said nozzle, and said grinding portion of said dental burr projecting exteriorly of said head; and

(c) pump means for feeding cooling water, injected from said nozzle, into said auxiliary coolant passageway of said dental burr, said pump means comprising screw means mounted on an outer periphery of said nozzle, and pump housing means mounted on one end portion of said holder means disposed close to said nozzle, said pump housing means surrounding said screw.

5,069,621

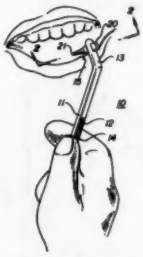
DENTAL APPLIANCE

Joseph R. Paradis, B212 Mariners Point, Hilton Head Island, S.C. 29926

Filed Sep. 15, 1988, Ser. No. 245,004
Int. Cl.[5] A61C 3/00
U.S. Cl. 433—147 18 Claims

1. An appliance comprising an elongated handle having opposite end portions and a rectangular aperture in one of said portions extending therethrough, which portion is angled with respect to the remainder of said handle;

a removable insert for said aperture, said insert including a hub rectangular in cross-section and bidirectionally insertable into said aperture and having a detent therein formed by an elongated linear surface groove; and



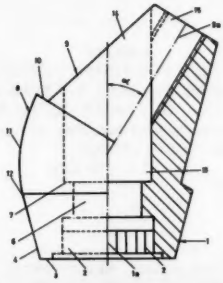
means in said aperture for locking into the elongated surface groove and retaining said insert therein.

5,069,622

SPACER

Bo Rangert, Mölnlycke; Lars Jörnéus; Claes Holmberg, both of Gothenburg, and Matts Andersson, Fåker, all of Sweden, assignors to Nobelpharma AB, Gothenburg, Sweden

Continuation of Ser. No. 271,824, Nov. 16, 1988, abandoned.
This application Apr. 20, 1990, Ser. No. 512,499
Claims priority, application Sweden, Nov. 18, 1987, 8704514
The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.
Int. Cl.[5] A61C 8/00
U.S. Cl. 433—173 10 Claims



1. An angulated spacer element adapted at its one end for attachment to a fixture having a threaded aperture and implanted in the jaw bone, said spacer element being adapted at its other end to support a dental prosthesis, comprising:

said spacer element being a unitary member;

said spacer element having a first portion with an end surface thereof permitting abutting engagement with the protruding end of the implanted fixture, said first portion also having a through bore aligned with said threaded aperture in the fixture and defining an internal ledge to enable a screw to pass through said bore, abut said ledge, and threadably engage the threaded aperture in the fixture;

said first portion having means for locking said spacer element in a selectable one of a plurality of rotational, fixed positions in relation to said protruding portion of said fixture;

said spacer element having a second portion for supporting the dental prosthesis on the spacer element, said second portion forming an acute angle with respect to said through bore of said first portion; and

wherein said locking means is adapted to cooperate with an interlocking means provided on the protruding portion of

the fixture and wherein one of said means is an n-sided polygon and the other means is a 2n-sided polygon.

5,069,623

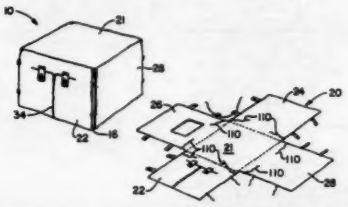
EDUCATIONAL PLAY STRUCTURE

Elas D. Peat, 41 Marion Rd., Bethany, Conn. 06525

Filed Apr. 2, 1990, Ser. No. 503,235

Int. Cl.[5] G09B *1/00*

U.S. Cl. 434—260 16 Claims



1. An educational play structure adapted for mounted over a card table comprising:

a flexible panel having a central portion dimensioned to overlie a card table and four side panels having opposed edge portions, said side panels extending from said central portion and dimensioned to generally extend the height and width of the card table so as to form an enclosure;

one of said panels comprising means for forming an entranceway comprising a zipper which is operable to open and close said entrance to permit entrance and egress therethrough;

an array of attachments having geometric shapes which are positioned on at least one side panel;

corner connecting means for releaseably connecting adjacent panels to each other at discrete locations wherein said connected adjacent panels are not jointed along substantial adjacent edge portions and have substantial gaps therebetween.

5,069,624

CONTACT ARRANGEMENT FOR ELECTRICAL INTERROGATION OF THE DATA OF A WHEEL REVOLUTION COUNTER

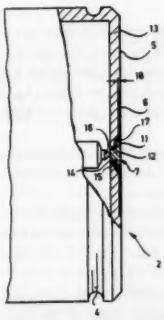
Heinz-Josef Hautvast, Brigachtal; Jürgen Adams, Villingen-Schwenningen, and Isa Sieber, Unterkirnach, all of Fed. Rep. of Germany, assignors to Mannesmann Kienzle GmbH, Villingen-Schwenningen, Fed. Rep. of Germany

Filed Mar. 15, 1991, Ser. No. 669,909

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1990, 4008162

Int. Cl.[5] H01R *39/00*

U.S. Cl. 439—16 11 Claims



1. A contact arrangement for the electrical interrogation of the data of a wheel revolution counter, comprising a substantially cylindrical metallic housing having means for fastening at a wheel hub of a vehicle and having at the housing front wall at least one contact part which is electrically insulated relative to the housing, characterized in that the contact part comprises:

a contact plate having at least one projection,

an insulating bush comprising a collar surrounding the projection and adjacent the contact plate,

a countersinked region and opening in the housing front wall for receiving the contact plate, said opening in the housing front wall corresponding to the diameter of the insulating bush, said bush collar forming a gap between the housing front wall and the contact plate,

adhesive means in the said gap and sealing together the housing and the contact plate.

5,069,625

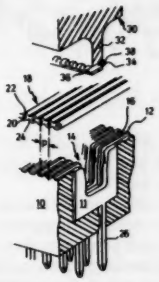
CONNECTOR FOR CONNECTING A PLURALITY OF INDIVIDUAL AT LEAST PARTIALLY INSULATED CONDUCTORS WITH ELECTRICAL CONTACTS

Konrad Brandt, Wedel/Holstein, Fed. Rep. of Germany, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 15, 1991, Ser. No. 670,080

Int. Cl.[5] H01R *4/24*

U.S. Cl. 439—404 8 Claims



1. Connector means for connecting a plurality of at least partially insulated conductors with electrical contacts, particularly of a flat cable having closely spaced conductors, said connector means comprising a retaining body retaining at least one row of contact elements, each of said contact elements having a pair of spaced opposing contact surfaces extending transverse to the longitudinal axis of said conductors, said retaining body including guiding means between said contact elements, and comprising a pressing body including a row of pressing elements having a width smaller than the distance between said contact surfaces of said contact elements and adapted to press a respective conductor between said contact surfaces of said pair of said contact surfaces when said retaining body and pressing body are pressed against each other such that the insulation is partially displaced and portions of said conductor freed from said insulation conductively engage said contact surfaces, characterized in that said contact surfaces are formed with contact legs of metallic U-elements, said pressing elements having an inversely T-shaped portion including a transverse portion, said transverse portion having pressing portions at the free end thereof, with the length of said transverse portion and said distance between said contact legs being selected such that upon pressing said pressing elements between said contact legs of said U-contacts, said conductors are bent around the inner edge at the free end of said contact legs and the insulation, if any, is displaced, and in that said pressing portions engage said conductor transverse to the longitudinal direction of said conductor and penetrates said insulation, if any, so that conductor portions free from said insulation are

pressed against said contact surfaces under a resilient pressure by said pressing portions acting on said conductor portions perpendicular to said longitudinal axis of said conductor portions.

5,069,626

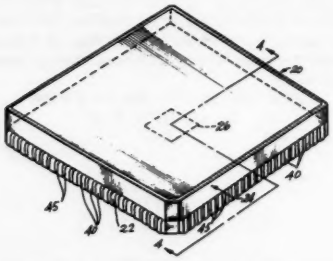
PLATED PLASTIC CASTELLATED INTERCONNECT FOR ELECTRICAL COMPONENTS

Timothy P. Patterson, Costa Mesa; Carl E. Hoge, Encinitas, and Joseph Bala, Santa Ana, all of Calif., assignors to Western Digital Corporation, Irvine, Calif.

Continuation of Ser. No. 456,049, Dec. 26, 1989, abandoned, which is a continuation of Ser. No. 159,692, Feb. 24, 1988, abandoned, which is a continuation-in-part of Ser. No. 69,425, Jul. 1, 1987, abandoned. This application Aug. 20, 1990, Ser. No. 569,518

Int. Cl.[5] H01R *9/09*

U.S. Cl. 439—55 **26 Claims**



1. A plated plastic castellated electrical interconnect comprising:

a substrate made from a molded polymeric material and comprising first and second principal surfaces substantially parallel to each other;

a plurality of separate, mutually spaced apart and individually compliant castellations integrally molded to the polymeric substrate and projecting from the second surface thereof to a substantially common plane spaced from the second surface, in which the individual castellations are compliant, on a microscopic level, so that the individual castellations are able to flex in three mutually orthogonal directions and thereby compensate for thermal expansion during use; and

a plurality of electrically separated metal conductors plated to the substrate by metal plating techniques, the substrate including spaced apart recessed regions extending between the first and second surfaces, and in which the castellations are aligned with corresponding recessed regions, each of the plated conductors extending continuously from the first surface, along a corresponding recessed region, to the common plane on a corresponding one of the castellations, the plated metal conductors being adapted for electrical connection to a first electrical component adjacent the first surface of the substrate and the conductors being arranged on the castellations for electrical connection to a second electrical component adjacent the second surface of the substrate.

5,069,627

ADJUSTABLE STACKING CONNECTOR FOR ELECTRICALLY CONNECTING CIRCUIT BOARDS

Jonathan E. Buck, Harrisburg, and John W. Kaufman, Hershey, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

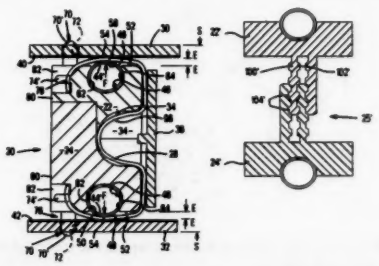
Filed Jun. 19, 1990, Ser. No. 540,038

Int. Cl.[5] H01R *9/09*

U.S. Cl. 439—66 **20 Claims**

1. An electrical connector for electrically connecting corresponding circuits on opposed surfaces of spaced apart parallel circuit boards comprising:

a first and a second housing engaged with each other via a plurality of integral interlocking members positioned on each housing, corresponding ones of said integral interlocking member of one housing interlocking with corresponding ones of said other integral interlocking members of the other housing to form a spacer having one of a



plurality of predetermined distances defined by engagement of said interlocking members;

an electrical circuit conductor attached to said spacer and disposed to electrically engage a plurality of electrical conductive paths positioned on each of said circuit boards, said electrical circuit conductor being adjustable to provide electrical connection between the circuit boards at any one of said predetermined distances.

5,069,628

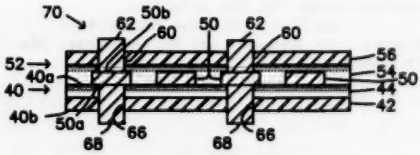
FLEXIBLE ELECTRICAL CABLE CONNECTOR WITH DOUBLE SIDED DOTS

William R. Crumly, Anaheim, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Mar. 13, 1990, Ser. No. 492,141

Int. Cl.[5] H01R *9/09*

U.S. Cl. 439—67 **26 Claims**



1. An electrical connector assembly, comprising:

a flexible sheet having first and second sides;

a plurality of electrically conductive traces formed over the first side of the sheet, the traces having first sides which face the sheet and second sides which face away from the sheet;

a plurality of electrically conductive dots formed on the second sides of the traces in electrical connection therewith respectively;

a plurality of substantially rigid dots which are carried by the sheet over the first sides of the traces in alignment with the conductive dots respectively; and

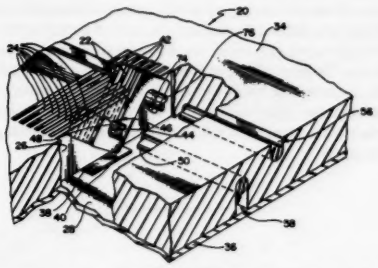
a coverlay formed on the first side of the sheet over the traces, the conductive dots extending through the coverlay from the second sides of the trace beyond the surface of the coverlay.

5,069,629

ELECTRICAL INTERCONNECT CONTACT SYSTEM

David A. Johnson, 5600 W. 25½ St., St. Louis Park, Minn. 55416

Filed Jan. 9, 1991, Ser. No. 639,126
Int. Cl.[5] H01R 9/09
U.S. Cl. 439—71 6 Claims



1. Apparatus for electrically interconnecting a lead of an integrated circuit device to a terminal spaced at a distance from the lead of the device, comprising:

(a) a housing interposed between the integrated circuit lead and the spaced terminal and having at least one contact receiving slot formed therein, said slot extending substantially parallel to an axis extending between a corresponding integrated circuit lead and spaced terminal, said housing further having oppositely facing first and second surfaces, said first surface having a trough formed therein proximate the integrated circuit lead, and said second surface having a trough formed therein proximate the spaced terminal;

(b) a rigid first element received in said trough formed in said first surface and extending across said slot;

(c) an elastomeric second element received in said trough formed in said second surface, said elastomeric second element having a measure of compressibility and tensile extendability; and

(d) a generally planar contact received within said slot, said contact having a protrusion extending outward from said first surface for engagement by an integrated circuit lead, a nub normally extending outward from said housing toward said second surface to engage the spaced terminal, and a hook portion, proximate said nub, encircling said elastomeric second element to hold said contact to said elastomeric second element, said contact having formed therein an elongated channel receiving said rigid first element therein for relative movement of said rigid first element along said channel as said protrusion is engaged by an integrated circuit lead;

(e) wherein, as said rigid first element moves relatively along said channel, said protrusion moves across the integrated circuit lead, and said nub moves across the spaced terminal.

5,069,630

SOCKET ASSEMBLY FOR ELECTRICAL PLUGS

Jeou N. Tseng; Chen S. Hong, and Jeng S. Wu, all of No. 15, Lane 167, Tung Nan Street, Hsinchu City, Taiwan

Filed Oct. 1, 1990, Ser. No. 591,270
Int. Cl.[5] H01R 13/44
U.S. Cl. 439—137 3 Claims

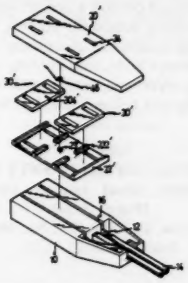
1. A socket assembly for electrical plugs comprising:

(a) a base member for carrying electrical elements required to establish a complete electrical connection upon the insertion of an electrical plug;

(b) a cover member mounted on the base member and provided with two pairs of hot slots therethrough, each pair of hot slots for insertion of an electrical plug;

(c) a securing plate secured to a bottom of the cover member to define a pair of chamber areas therewith, each chamber area corresponding to a respective pair of hot slots of the cover member, the securing plate being provided with a prior member and two pairs of hot slots therethrough corresponding to and aligned with the two pairs of hot slots of the cover member;

(d) a sliding plate disposed within each chamber area, each sliding plate being provided with an intermediate notch and a pair of guiding slots therethrough, each guiding slot including a tapered side face, the side faces of each pair of guiding slots being normally positioned opposite a pair of hot slots being in the cover member to block communication between corresponding pairs of hot slots in the base



and cover members, the sliding plates being slidably displaceable upon the insertion of an electrical plug through a pair of hot slots in the cover member and forced engagement of the plug against the tapered side faces of the sliding plate; and

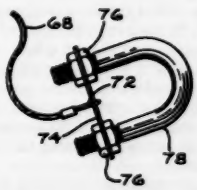
(e) a spring centrally disposed intermediate the chamber areas for biasing and maintaining the side faces of the sliding plates in the normal positions, the spring including a central portion retained on the pin member of the securing plate and two opposite ends, each opposite end being engaged within the intermediate notch of a sliding plate.

5,069,631

ELECTRICAL BREAKAWAY CONDUCTOR

David M. Bauer, Iffezheim, Fed. Rep. of Germany, and David L. Gilbert, Paulding, Ohio, assignors to Aeroquip Corporation, Jackson, Mich.

Filed Mar. 30, 1990, Ser. No. 501,915
Int. Cl.[5] H01R 13/62
U.S. Cl. 439—159 8 Claims



1. In an electrical breakaway connector for electrical conductor systems between a pair of selectively interconnectable vehicles having a flexible conductor member attached to one vehicle and an electrical receptacle member mounted on the other vehicle, one of said members having elongated male terminals and the other member having elongated female terminals connectively receiving the one member male terminals upon non-rotative linear movement of said members toward each other to establish an electrical connection therebetween, the improvement comprising, an actuator body mounted on the flexible conductor member adjacent to the receptacle member, actuator means mounted upon said body movable

between a first position non-interfering with the interconnected members and a second separation-inducing position, and a flexible lanyard having a first end connected to said actuator means and a second end connectable to the one vehicle, the length of the flexible conductor member being greater than the length of said lanyard whereby attachment of said lanyard second end to the one vehicle causes said lanyard to be tensioned to displace said actuator from said actuator first position to said second position disconnecting the members upon the vehicle separating prior to significant tension being applied to the conductor member, said actuator body including a fitting having terminals defined within the fitting and in electrical connection with the receptacle terminals, fitting receiving means defined on said actuator body, said receiving means including holding means for holding the fitting within said fitting receiving means and comprising a concave cradle defined on said actuator body, said holding means comprising a bridge extending over said cradle, and threaded fasteners releasably mounting said bridge upon said body.

10. An electric lamp socket, comprising:

a socket housing including a collar formed of two separate collar components biased together and adapted to be splayed apart upon insertion of a lamp,

first and second socket outlets,

a first switch having a pair of contacts connected respectively to a first feeder and the first socket outlet,

a second switch having a pair of contacts connected respectively to a second feeder and the second socket outlet, and

first and second armatures respectively secured at a first end thereof to the collar components and pivotally coupled at an intermediate point thereof to the socket housing;

such that the splaying apart of the collar components displaces a second end of the armatures into closing the switches.

5,069,632

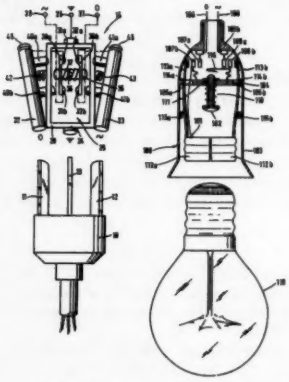
ELECTRICAL SUPPLY SAFETY SOCKET

Shimon Avitan, Holon, Israel, assignee: Hogen Oshrat Ltd., Holon, Israel

Filed Nov. 29, 1989, Ser. No. 442,976

Int. Cl.[5] H01R *13/703*

U.S. Cl. 439—188 **10 Claims**



1. An electrical supply safety socket, comprising:

a socket housing,

first and second socket outlets articulatedly mounted with respect to the housing so as to be capable of pivotal displacement with respect to each other,

a first switch having a pair of contacts connected respectively to a first feeder and the first socket outlet,

a second switch having a pair of contacts connected respectively to a second feeder and the second socket outlet,

first spring biasing means for biasing the outlets into a non-parallel disposition,

an armature support pivotally mounted on the housing,

a pair of insulating armatures articulated to the support so as to be pivotally displaceable therewith and so as to be displaceable towards and away from each other, thereby bringing respective first and second switch contacts towards and away from each other,

second spring biasing means for biasing the armatures away from each other, and

abutting means extending laterally from the outlets to the armatures;

whereby simultaneous displacement of the outlets into a substantially parallel disposition results in the displacement of the armatures towards one another and the contacting of the switch contacts.

5,069,633

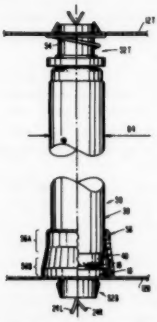
PROTECTIVE SHIELD FOR LAMP CONNECTIONS

Michael J. Straka, Newburgh, and Gino J. Ciancanelli, Bayside, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Apr. 15, 1988, Ser. No. 181,855

Int. Cl.[5] H01R *13/52*

U.S. Cl. 439—271 **4 Claims**



1. A protective shield for preventing moisture from reaching electrical connections of a lamp inserted in a lampholder, said lamp including an envelope having a cap attached to an end thereof with a rim of the cap surrounding said end, and said electrical connections including electrical contacts in said cap for contacting respective electrical contacts in the lampholder and electrical lamp lead-in conductors contained in the cap which are electrically connected to the contacts in the cap;

characterized in that said shield comprises:

a. a waterproof resilient cover part dimensioned to fit tightly around the end of the envelope and extending over at least the rim of the cap, said cover part preventing moisture from entering the cap through any unsealed space between the rim and the envelope; and

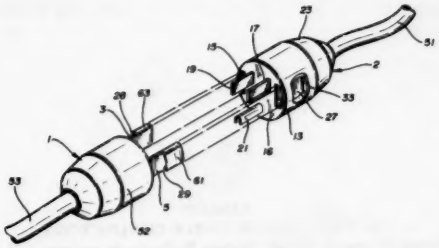
b. a waterproof resilient barrier part for preventing moisture from entering a space in the lampholder where the contacts thereof are located, said barrier part comprising an integral extension of the cover part for surrounding an end of the lampholder which is disposed adjacent the cap and dimensioned to reach a panel in which the lampholder is mounted, the extension having a circumference which increases with distance from the cover part to clear the lamp holder and press against the panel for preventing moisture from entering any gap between facing surfaces of the lampholder and the cap.

5,069,634

SNAP LOCK EXTENSION CORD AND POWER TOOL CONNECTOR

Martin J. Chiarolanzio, 21 Keep St., Madison, N.J. 07940

Filed Jan. 24, 1991, Ser. No. 646,073
Int. Cl.[5] H01R *13/627*
U.S. Cl. 439—353 15 Claims



1. A two-piece electrical cord termination and connection device for temporarily connecting a first and second electrical cord, said device comprising:

(a) a first and second body member, each said body member having at least one substantially planar face surface;

(b) at least one semi-flexible finger extending substantially perpendicularly from said face surface of said first body member, said finger having at least one side surface, wherein said side surface has a locking tab extension protruding therefrom;

(c) at least one finger receptacle orifice on said face surface of said second body member, said receptacle orifice being so formed as to allow for the passage of said semi-flexible finger and said locking tab extension therethrough; and

(d) at least one side orifice formed within the side of said second body member, said side orifice intersecting said finger receptacle orifice, and said side orifice being at least as large as said locking tab,

wherein said finger receptacle orifice on said face surface of said second body member aligns with said semi-flexible finger of said first body member and said locking tab extension protruding from said flexible finger of said first body member interferes with the passage of said flexible finger into said finger receptacle orifice of said second body member, said interference being removed by the deformation of said semi-flexible finger in a direction opposite said locking tab extension, until both said semi-flexible finger and said locking tab extension align with said finger receptacle orifice, such that said deformation of said semi-flexible finger creates a spring bias within said semi-flexible finger in resistance to said deformation and wherein said locking tab extension has at least one side edge surface that faces said face surface of said first body member, said side edge surface having a relief formed therein.

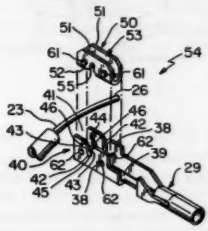
5,069,635

VACUUM CLEANER HOSE CONSTRUCTION AND METHOD OF MAKING THE SAME

Homer N. Holden, Sylva; Philip K. Loyer, Waynesville, both of N.C.; Lowell T. Noyes, Redding, Conn., and Janos J. Legrady, Putnam Valley, N.Y., assignors to Dayco Products, Inc., Dayton, Ohio

Division of Ser. No. 237,344, Aug. 26, 1988, Pat. No. 4,894,020.
This application Oct. 26, 1989, Ser. No. 427,421
The portion of the term of this patent subsequent to Jan. 16, 2007, has been disclaimed.
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—400 16 Claims

1. In a construction that comprises an electrical conductor provided with an end portion, and an electrical connector fixed to said end portion, said connector having a pair of spaced apart knife-like portions each being provided with opposed edges defining sides of a slot therein that has an open end and a closed end, said knife-like portions of said connector having said open ends of said slots thereof facing in the same direction and being interconnected together at one end thereof to an intermediate part of said connector whereby said portions and said part define a U-shaped configuration that has a bight facing in the same direction as said open ends of said slots, said end portion being disposed in said slots of said connector and being wedges between said opposed edges thereof for providing electrical connection therebetween, said connector having holding means carried thereby and disposed adjacent said conductor to hold said conductor in said slots by trapping said conductor between said holding means and said closed ends of said slots, said holding means comprising a U-shaped holding member having a pair of spaced apart legs and a cross member interconnecting said legs together, said legs being respectively disposed adjacent said knife-like portions and between the



same, the improvement wherein the bight of said U-shaped holding member faces in the same direction as said bight of said connector and wherein said leg of said holding member has a pair of spaced apart snap-fitting means snap-fitting with its respective knife-like portion of said connector to hold said holding member to said connector, each pair of said snap-fitting means being disposed on a line that generally passes through said conductor, said legs of said holding means comprising a pair of knife-like portions disposed in spaced apart parallel relation and being interconnected together by said cross member, each knife-like portion of said holding means having opposed edges defining sides of a slot therein that has an open end and a closed end, said knife-like portions of said holding means having said open ends of said slots thereof facing in a like direction that is opposite to the direction that said slots of said connector face.

5,069,636

TERMINAL BLOCK AND ADAPTER

Gerald L. Shimirak, Danville; Paul S. Chan, San Francisco, both of Calif.; John Kay, Swindon, United Kingdom; Jim Croce, Willow Springs; Van L. Huynh, Garner, both of N.C.; John Swinmurn, Los Altos, Calif., and Eric Bierlein, Cary, N.C., assignors to Raychem Corporation, Menlo Park, Calif.

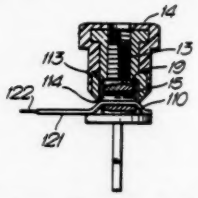
Continuation of Ser. No. 462,173, Jan. 8, 1990, abandoned, which is a continuation-in-part of Ser. No. 270,411, Nov. 7, 1988, abandoned, which is a continuation of Ser. No. 130,347, Dec. 8, 1987, abandoned, which is a continuation-in-part of Ser. No. 102,072, Sep. 29, 1987, abandoned, which is a continuation-in-part of Ser. No. 70,475, Jul. 7, 1987, abandoned.
This application Oct. 23, 1990, Ser. No. 601,023
Int. Cl.[5] H01R *4/24*
U.S. Cl. 439—412 24 Claims

1. A terminal block adapter for connecting an insulated wire to a conductive binding post of the terminal block comprising in combination an insulative collar and a threaded cap wherein:

the collar comprises (a) a first opening means therethrough which is smaller in one portion for receiving the binding post from one side of the collar and is larger in another portion for receiving the cap from the opposing side of the collar thereby forming a shoulder in the first opening means proximate to the bottom of the cap when installed

whereby the threads in the cap can engage the threads on the binding post and (b) a second opening means in a lateral side thereof, communicating with the first opening means and being positioned laterally opposite from the position of the binding post received in the first opening means, for receiving an insulated wire whereby the wire is positioned by the second opening means at least in part adjacent the binding post and underneath the cap and is engaged by the cap when the cap is threaded on the binding post; and

the cap comprises a conductive inner portion and an insulative outer portion wherein the conductive inner portion has thread means adapted to engage the thread means on the binding post and has bottom edge means for engaging



the wire positioned in the second opening means of the collar and adjacent the binding post and for compressing the wire

against the shoulder means in the first opening means as the cap is tightened on the binding post whereby the edge means contacts a conductor in the wire by passing through the insulation on the wire; and

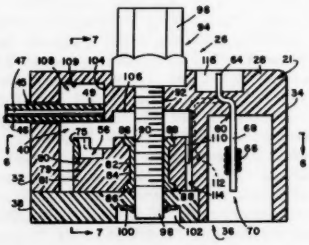
wherein the collar and cap contain cooperative stop means for stopping the advance of the cap on the binding post at a preselected distance between the edge means of the cap and at least the portion of the shoulder means against which the wire is compressed, thereby allowing connection of the edge means of the cap through the insulation of the wire to a conductor in the wire without breaking or severing the wire.

5,069,637

INSULATION DISPLACING ELECTRICAL CONNECTOR

Richard C. Baubles, Maplewood, N.J., assignor to Jacobson Mfg. Co., Inc., Kenilworth, N.J.

Filed Jun. 14, 1991, Ser. No. 715,466
Int. Cl.[5] H01R 4/24
U.S. Cl. 439—412 **35 Claims**



1. An electrical connector comprising:

a housing defining a cavity therein;

an inlet in said housing to said cavity through which an electrical conductor may be inserted into said cavity;

a first electrical contact disposed in said cavity movable between an open position in which an electrical conductor may be inserted into said cavity adjacent said first contact and a closed position in which said first contact engages and makes electrical contact with said electrical conductor inserted into said cavity;

means actuatable from the exterior of said housing for moving said first contact between said open and closed positions, and

a second contact fixed with respect to said cavity and in electrical contact with said first contact at least in said closed position of said first contact, whereby an electrical connection may be made between said conductor and said second contact.

5,069,638

CONNECTOR FOR CABLE CONDUCTORS

Petrus Wouter H. Schalk, Drunen, Netherlands, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 11, 1990, Ser. No. 536,342
Int. Cl.[5] H01R 4/24
U.S. Cl. 439—439 **10 Claims**

1. A connector comprising:

a housing of electrically insulating material provided at one side with at least one channel for inserting and withdrawing a conductor of electrically conductive material, said channel having one pivotally movable wall and a second fixed wall, and

at least one contact element of electrically conducting material disposed in said housing, one end of said contact element being free and forming said one pivotally movable wall of said channel, a portion of the housing forming said second fixed wall of the channel, the other end of the contact element being fixed in and extending through a second side of the housing, said one end of the contact element being provided with an aperture through which said conductor extends, said conductor passing completely from one end of the aperture to the other, said aperture having an edge at its one end for clamping the conductor at said one end of the contact element which forms said one pivotally movable wall of the channel, said one wall of the channel being spring-loaded and pivotable only about a pivot point near where the other end of the contact element is fixed in said second side of the housing, said conductor being clamped by said edge so as to be pressed between said movable one wall and fixed second wall of said channel while remaining substantially free while passing through said aperture,

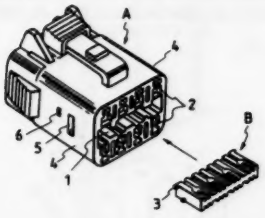
whereby insertion of the conductor into the channel causes said one movable wall to pivot away from said second fixed wall and open the channel to permit the conductor to enter and pass through the channel into the housing while preventing the conductor from being withdrawn due to the clamping action on the conductor by the edge of the aperture in said pivotable one wall, said aperture also permitting the pivotable wall of the contact element to contact both sides of the conductor.

5,069,639

METAL TERMINAL RETAINING MECHANISM FOR CONNECTOR

Shinji Kodama; Satoshi Yamada, and Sakai Yagi, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Mar. 4, 1991, Ser. No. 664,232
Claims priority, application Japan, Mar. 8, 1990, 2-55009
Int. Cl.[5] H01R *13/44*
U.S. Cl. 439—595 4 Claims



1. In an electrical connector, a metal terminal retaining mechanism comprising:

a connector housing having two flexible retaining pieces provided in a terminal receiving chamber so as to retain a metal terminal; and

a spacer, movably connectable to said connector housing and having a provisional retaining position and a complete retaining position;

said spacer being configured such that, in a provisional retaining position of said spacer, one of said flexible retaining pieces is driven to a position out of engagement with said metal terminal; and

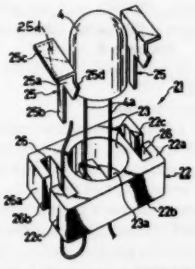
said spacer further being configured such that, in a complete retaining position of said spacer, said one of said flexible retaining pieces is driven to a position in engagement with said metal terminal.

5,069,640

MINIATURE BULB ASSEMBLY AND METHOD OF PRODUCING THE SAME

Takasi Wasimoto, Yokohama, and Morio Kimura, Fukushima, both of Japan, assignors to Stanley Electric Co., Ltd. and Alpine Electronics Inc., Japan

Filed Aug. 27, 1990, Ser. No. 573,538
Claims priority, application Japan, Aug. 29, 1989, 1-222578
Int. Cl.[5] H01K *1/00*
U.S. Cl. 439—619 22 Claims



17. A miniature bulb assembly adapted to be mounted upon a base board, said miniature bulb assembly comprising:

a socketless miniature bulb having a pair of lead wires extending therefrom,

a base member molded of a synthetic resin having an electrical insulating property, said base member having upper and lower surface and two pairs of opposing sidewalls and being formed with a bulb receiving recess in the form of an annular cavity arranged at substantially the central portion of and extending downwardly from said upper surface, a pair of lead wire holes arranged in the bottom of said cavity and extending to said lower surface, and a pair of rectangle terminal insert holes arranged on opposite sides of said recess, said bulb receiving recess receiving said miniature bulb in an upright standing position at the time of an assembling operation which is performed with said lead wires inserted through said lead wire holes, and

a pair of conductive terminal members, each of said terminal members comprising an elongated planar plate-shaped terminal portion having an integral fixing pawl formed by cutting out a portion of the elongated plate-shaped terminal and bending said pawl so that a portion thereof extends away from the plane of said plate-shaped terminal portion, each pawl being forced toward alignment with the plane of said plate-shaped member as it is being inserted into a terminal insert hole in said base portion,

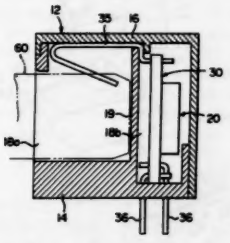
each terminal insert hole having a stepped portion, said fixing pawl being snap-fitted into said stepped portion as it becomes aligned with said stepped portion.

5,069,641

MODULAR JACK

Yukio Sakamoto; Toshio Hori, both of Fukui, and Iwao Fukutani, Takefu, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Jan. 30, 1991, Ser. No. 647,932
Claims priority, application Japan, Feb. 3, 1990, 2-10076[U]
Int. Cl.[5] H01R *13/66*
U.S. Cl. 439—620 6 Claims



1. A modular jack to be mounted on a circuit board, said modular jack comprising:

a printed board containing an electronic element for suppressing noise;

a contactor for contacting with a plug, said contactor being electrically connected with the electronic element by a wire on the printed board;

a terminal for contacting with the circuit board, said terminal being electrically connected with the electronic element by a wire on the printed board; and

an insulating housing for encasing the printed board.

5,069,642

KILL FUNCTION FOR A STEERED TROLLING MOTOR

William A. Henderson, Starkville, Miss., assignor to Zebco Corporation, Tulsa, Okla.

Filed Jul. 24, 1990, Ser. No. 558,326
Int. Cl.[5] B60L *11/02*
U.S. Cl. 440—6 18 Claims

1. A trolling motor system comprising:

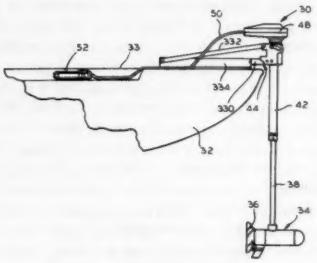
a trolling motor including a propeller;

means for mounting the trolling motor to a boat for rotation about an axis to effect steering of the boat, said mounting means including means for moving said trolling motor between an operative position and a stowed position;

means for sensing position of said trolling motor;

electrically operable steering means coupled to said sensing

means and mounted to said mounting means for steering said trolling motor and including means for electrically



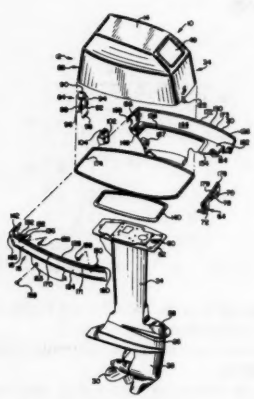
disabling said steering means if said motor is not in the operative position.

5,069,643

MOLDED LOWER MOTOR COVER

Tom Westberg, Waukegan, Ill., and Joseph A. Mattiazzi, Kenosha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed May 18, 1990, Ser. No. 525,595
Int. Cl.[5] B63H *21/00*
U.S. Cl. 440—77 **19 Claims**



1. A molded lower motor cover for an outboard motor, comprising:

a first cover portion having an outer wall with a thickness, an upper edge and an inside edge;

a second cover portion having an outer wall with a thickness, an upper edge and an inside edge, said second cover portion generally being a mirror image of said first cover portion;

a laterally opening groove formation disposed generally horizontally relative to an inner face of said outer wall of each of said cover portions, each said groove formation being integrally joined to said associated wall by an inwardly projecting web having a thickness and being integrally joined to said inner face of said wall, each said lower cover portion, said corresponding groove formation, and said corresponding web being molded together as one piece; and each of said outer walls being thickened relative to said wall thickness and to said thickness of said web at a linear attachment point of said web to said wall, thereby ensuring that said wall will have a smooth outer surface without any sink marks; and

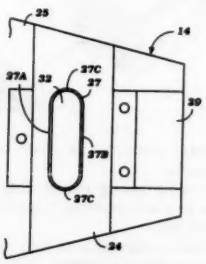
fastening means on each of said cover portions for securing said portions to each other along said respective inside edges.

5,069,644

COWLING AND AIR INLET DEVICE FOR OUTBOARD MOTOR

Seiji Kobayashi, and Masaharu Miyazaki, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 30, 1989, Ser. No. 444,084
Claims priority, application Japan, Nov. 30, 1988, 63-301054
Int. Cl.[5] B63H *21/24*
U.S. Cl. 440—77 **11 Claims**



1. A cowling and air inlet device for the powerhead of an outboard motor having an internal combustion engine including an induction system, comprising air inlet means for inducting air from the atmosphere formed in an upper rear surface of said cowling and open only on at least one side of said cowling, air intake means formed within said air inlet means for supplying air to said induction system, and a cover secured to said cowling for covering said air intake means, said cover being positioned upward of said air intake means and spaced therefrom to cooperate in defining a flow path for air through said air inlet means to said air intake means, the upper rear surface of said cowling having a recess formed therein rearwardly of said air inlet means, said cowling having a wall portion separating said air inlet means from said recess and said cover including a handle extending over the recess for grasping of the handle.

5,069,645

COIN BANK

Ralph M. Dworman, and Nancy S. Dworman, both of Worcester, Mass., assignors to Ralphco, Inc., West Boylston, Mass.

Filed Aug. 27, 1990, Ser. No. 573,549
The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.
Int. Cl.[5] A45C *1/12*; B63H *33/30*
U.S. Cl. 446—8 **5 Claims**

1. A coin bank comprising:

(a) a cylindrical tubular intermediate portion which has a vertical central longitudinal axis, a circular inner surface, a circular outer surface, a top end with a top opening, and a bottom end with a bottom opening,

(b) a base portion which has a bottom wall and a cylindrical upper end which is removably attached to the bottom end of said intermediate portion, said cylindrical upper end having a top opening,

(c) a two-part cap portion which has an outer wall which defines a hollow interior and a coin slot in said outer wall, the interior of said two-part portion being open to the interior of said intermediate portion below said coin slot, said two-part cap portion comprising:

(1) a lower part which has a top wall, a hole in said top wall, a cylindrical lower end which fits snugly within the top opening of said intermediate portion so that said

lower part is removably attached to the top end of said intermediate portion,

(2) an upper part which has an annular lower edge which is substantially larger than the hole in said top wall and

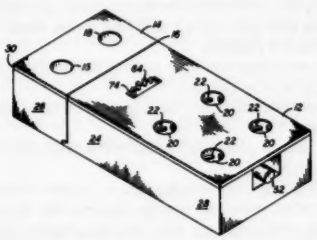
a reduced bottom portion which fits snugly within the hole in said top wall so that said lower edge rests on said top wall when said reduced portion is fully inserted into said hole.

5,069,646

TOY SAWABLE WOOD

Steven P. Hanson, Orchard Park, and Bartley E. Williams, East Aurora, both of N.Y., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Jul. 10, 1990, Ser. No. 550,398
Int. Cl.[5] A63H *33/04*
U.S. Cl. 446—85 6 Claims



1. Toy sawable wood comprising:

a first simulated wood member;

a second simulated wood member releasably attachable to the first simulated wood member for forming a simulated piece of wood;

a reciprocally movable rod rotatably mounted in the first simulated wood member having a threaded connecting end movable into engagement with the second simulated wood member; and

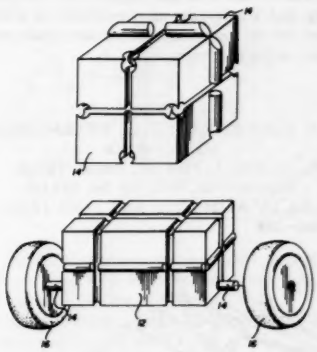
means in the second wood member for engaging the threaded connecting end for releasably holding the members together and responsive to simulated sawing for releasing the first wood member from the second wood member.

5,069,647

SOLID RECTANGULAR BUILDING BLOCK FOR A TOY BUILDING SET

Marcelo M. Zuviria, 2319 14th Street, Apt. 7, Santa Monica, Calif. 90405

Filed Apr. 19, 1990, Ser. No. 511,342
Int. Cl.[5] A63H *33/08*
U.S. Cl. 446—127 10 Claims



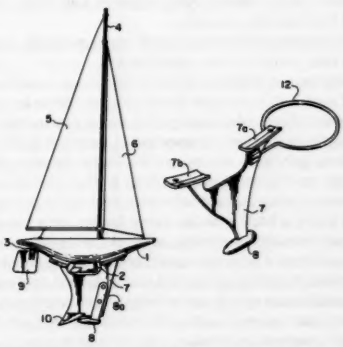
1. A solid rectangular building block or a toy building set, said block having size faces and an integral intermediate planar member lying in a plane parallel to a first two of aid faces and projecting beyond the plane of at least one of the remaining faces to constitute a tongue, said fist two of said faces each having at least two intersecting grooves therein extending perpendicular to one another for receiving the tongue of a like building block in frictional interlocking relationship therewith; and in which said one of aid remaining faces has at least one intermediate groove therein perpendicular to the plane of said planar member and intersecting said tongue.

5,069,648

SAILING BOAT MODEL ADAPTED FOR EXHIBITION AND FOR SAILING ON THE WATER

Jiro Ozeki, Tokyo, Japan, assignor to Slidex Corporation, Tokyo, Japan

Filed Oct. 30, 1990, Ser. No. 605,375
Claims priority, application Japan, Jul. 10, 1990, 2-181744
Int. Cl.[5] A63H *23/02*
U.S. Cl. 446—160 15 Claims



1. A sailing boat scale model adapted for exhibition and for actual sailing on water, comprising:

a hull;

a keel provided on a bottom portion of a midship of the hull to extend downward from the hull;

a rudder provided on a bottom portion of a stern of the hull;

a mast provided on the hull to extend upward from the hull;

a sail connected to the mast;

the hull, keel, rudder, mast and sail having relative dimensions which simulate an actual sailing boat; and,

auxiliary means to allow the scale model to sail on water including a keel body to be detachably attached to and extend downward from the bottom of the hull during such sailing, and a balancing mass provided on a lower end portion of the keel body for up and down movement relative to the keel body.

5,069,649

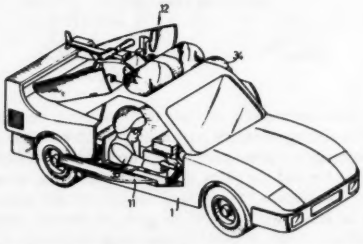
TOY POLICE CAR WITH A RETRACTABLE HELICOPTER

Hai M. Wu, No. 630, An Ping Rd., Tainan, Taiwan

Filed Nov. 19, 1990, Ser. No. 615,139

Int. Cl.[5] A63H *17/25, 5/00, 17/00, 17/26*

U.S. Cl. 446—288 **1 Claim**



1. In a toy police car or the like with an outer body, a floor plate, a mounting assembly on the floor plate, a battery-driven electric motor, a transmission assembly mounted on the mounting assembly, a sound assembly, a two-level cam consisting of an upper cam and a lower cam, and a projection assembly controlled by the upper cam to control intermittent projection of two toy policemen out from the car, the improvements comprising:

a push rod intermittently displaced by said lower cam at a first end thereof, a second end of said push rod being substantially a rack whose teeth face upward;

a return spring attached to said rack at one end thereof and fixed to the floor plate at a second end thereof;

a pinion engaging with said rack and being coaxial with two gears, a U-shaped fixed member being provided at a rear of each said gear for receiving a movable member, a central fixing member lying between and being fixed to said two movable members;

a roof consisting of two L-shaped plates pivotally mounted at a rear portion of the outer body;

a helicopter mounted on said central fixing member under said roof, said helicopter having blades driven by a pulley disposed thereunder, said pulley being connected to said blades by a shaft and connected to a second pulley by an endless belt, said second pulley being drivable by said motor via a series of gears, a front surface of said movable members being formed into teeth such as to engage with said gears, a hook member being formed on a top of both of said movable members, a height restraining member being mounted adjacent to said central fixing member; and

said helicopter moving upward out from said roof and biasing said return spring under intermittent activation of said lower cam on said push rod until being stopped by said height restraining member, said helicopter moving downwardly by said return spring when said lower cam disengaging with said activating rod, and said hook members of said movable members impinging on said L-shaped plates, thereby closing said roof during the downward movement of the helicopter.

5,069,650

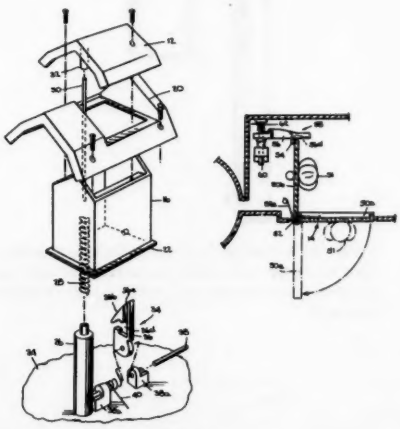
POP-OUT TOY

Roger W. Lehmann, 18 Flintlock Ct., Bernardsville, N.J. 07924, and Michael I. Statten, 4 Farmers Rd., Kings Point, N.Y. 11024

Filed Feb. 23, 1990, Ser. No. 484,225

Int. Cl.[5] A63H *33/42*

U.S. Cl. 446—476 **10 Claims**



1. A pop-out toy, comprising:

a. a toy having a toy building structure,

b. a manually actuable pop-out toy element movably mounted in said toy building structure for movement in a first direction into pop-out position relative to said toy building structure, and in the opposite direction into retracted position relative to said toy building structure,

c. first spring means between said toy building structure and said pop-out toy element biased to urge said pop-out toy element in said first direction toward the pop-out position,

d. said pop-out toy element being manually movable in said opposite direction against said first spring means toward the retracted position,

e. a latch mechanism between said toy building structure and said pop-out toy element,

f. said latch mechanism comprising a pin on said pop-out toy element,

g. a pin-keeper pivotally connected to said toy building structure, and

h. second spring means urging said pin-keeper into latching engagement with said pin to prevent the pop-out toy element form moving into pop-out position either by manual actuation in said first direction or under the action of the first spring means,

i. means, operated by said pop-out toy element when it is moved manually further in said opposite direction, for disengaging the pin-keeper from the pin to free the pop-out toy element for movement in said first direction under the action of the first spring means into pop-out position,

j. the pin-keeper being pivotally movable in two planes,

k. said pin-keeper being pivotally movable in the first of said planes into latching engagement with the pin,

l. said pin-keeper being further pivotally movable in the first of said palens out of latching egnagement with said pin, and

m. said pin-keeper being then pivotally movable in the second of said planes to release the pin and thereby release

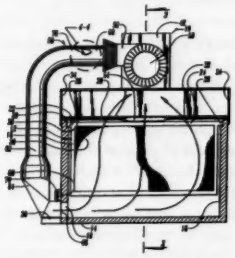
the pop-out toy element for movement under the action of the first spring means into pop-out position.

5,069,651

METHOD AND APPARATUS FOR REMOVING PARASITES FROM BEES

Maurice W. Arndt, 115 - 11th St. SE., Altoona, Iowa 50009

Filed Jul. 23, 1990, Ser. No. 555,835
Int. Cl.[5] A01K *51/00*
U.S. Cl. 449—2 **9 Claims**



8. Apparatus for removing parasitic mites from bees within a hive, said hive having a top wall, a bottom wall, and side walls enclosing a hive compartment, a bottom opening being provided in said hive adjacent said bottom wall for permitting said bees to enter and exit said hive compartment, said apparatus comprising:

frame means adapted to be attached to said top of said hive, said frame means containing an air passageway having first and second ends, said first end of said passageway being adapted to be in communication with said hive compartment when said frame means is attached to said top of said hive;

conduit means having first and second ends, said first end of said conduit being attached to said second end of said passageway, said second end of said conduit being adjacent said bottom opening of said hive;

spout means attached to said second end of said conduit and having a spout opening sized and shaped to fit in sealing mating relation over said bottom opening of said hive;

fan means in communication with said passageway of said frame means for causing air to be forced through said passageway and said conduit through said spout opening of said spout; and

heater means in communication with said passageway for heating said air to a temperature high enough to cause said parasites to drop off said bees within said hive and low enough to be tolerated by said bees.

5,069,652

KEEL BONE CUTTER

Jacobus E. Hazenbroek, Burg de Zeeuwstraat 52, Numansdorp, Netherlands

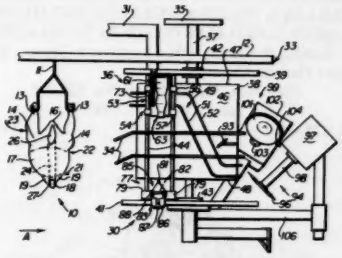
Continuation-in-part of Ser. No. 605,542, Oct. 29, 1990. This application Nov. 13, 1990, Ser. No. 612,553
Int. Cl.[5] A22C *21/00*
U.S. Cl. 452—165 **24 Claims**

1. A method of removing the breast portion of previously eviscerated birds as the birds are carried along a poultry processing line, comprising the steps of:

moving on a overhead conveyor system a plurality of birds in series along a processing path with the birds suspended by their legs from the overhead conveyor system, the visceral openings of the birds facing upwardly and the neck openings of the birds facing downwardly as the birds move;

moving a mandrel downwardly into the visceral cavity of each bird and expanding the visceral cavity of each bird in response to the downward movement of the mandrel,

moving a holding means upwardly toward each mandrel into stabilizing engagement with the neck portion of each bird on each mandrel so as to positively engage the neck portion of each bird between the holding means and its mandrel to stabilize the neck portion of each bird;



while the holding means and mandrels engage the neck portion of each bird, separating the breast from the shoulders and back portion of each bird; and

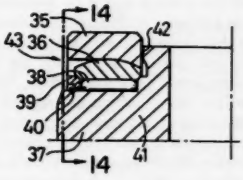
removing the mandrel from each bird and moving the holding means away from each bird.

5,069,653

TRIPOT TYPE CONSTANT VELOCITY UNIVERSAL JOINT

Yasumasa Mizukoshi, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 69,759, Jul. 6, 1987, Pat. No. 4,854,917. This application Jul. 31, 1989, Ser. No. 386,810
Claims priority, application Japan, Dec. 23, 1986, 61-305261
Int. Cl.[5] F16D *3/26*
U.S. Cl. 464—111 **3 Claims**



1. A tripot type constant velocity universal joint, comprising:

a first rotary member provided with three pairs of parallel planar track surface pairs,

a second rotary member having three trunnions corresponding to said track surface pairs,

a respective cylindrical roller assembly loosely fitted to each trunnion and engaged with the corresponding track surface pair, said roller assembly comprising a cylindrical outer race rolling on the corresponding track surface pair, an inner race loosely fitted to said outer race, and a plurality of rolling members interposed between said inner race and said trunnion, said inner race being axially constrained on said trunnion and having outer peripheral surface portions of convex spherical shape, and said outer race having inner peripheral surface portions of concave spherical shape in spherical surface contact with said outer peripheral surface portions of said inner race such that said outer race is pivotably movable about a point on an axis of said trunnion, and

pivot controlling means for restricting the pivotal movement

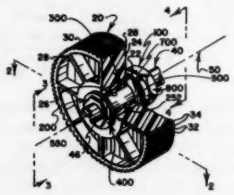
of said outer race to planes parallel to a plane perpendicular to a rotary axis of said second rotary member, such that the direction of rolling movement of said outer race relative to the corresponding track surface pair is perpendicular to the axis of said trunnion.

5,069,654

SYSTEM FOR DRIVINGLY CONNECTING GEARS, PULLEYS, WHEELS, ROLLERS AND OTHER APERTURED COMPONENTS TO SHAFTS

John F. Rampe, Bratenahl, Ohio, assignor to Jepmar Research, Fairport Harbor, Ohio

Filed Nov. 30, 1990, Ser. No. 621,079
Int. Cl.[5] F16H *55/00*
U.S. Cl. 474—161 **110 Claims**



1. A method of establishing a connection between a first component and a second component, comprising the steps of:

a) providing a first component with a hole that extends through a selected part of the first component, with the hole defining a first component hole portion (i) that is of generally cylindrical configuration, (ii) that has opposed first and second end regions, and (iii) that has a substantially constant inner diameter surface that extends substantially coaxially about an imaginary first axis for substantially the full distance between the opposed first and second end regions;

b) providing a second component with an elongate formation, with the elongate formation defining a second component shaft-like portion that is of generally cylindrical configuration and has a substantially constant outer diameter surface that extends substantially coaxially about an imaginary second axis for substantially the full length of the second component shaft-like portion, with said outer diameter surface being sufficiently smaller in diameter than is the diameter of said inner diameter surface so that, when the outer diameter surface is received substantially coaxially within the inner diameter surface, there is a sleeve-like annular space of substantially uniform thickness that separates the inner diameter surface of the first component from the outer diameter surface of the second component, with the annular space having opposed first and second end regions that are located relatively near to the first and second opposed end regions, respectively, of the first component hole portion;

c) positioning the first and second components (i) such that the first and second imaginary axes align so as to extend coaxially along an imaginary center axis, and (ii) such that the outer diameter surface is received substantially coaxially within the inner diameter surface so that said sleeve-like annular space of substantially uniform thickness is defined between the inner and outer diameter surfaces, with the annular space extending substantially coaxially about the imaginary center axis between the opposed first and second end regions of the annular space;

d) providing within the annular space a quantity of solid-form elastomeric material extending circumferentially about the outer diameter surface so as to occupy a substantially sleeve-like annular volume that extends axially from (i) a first end region thereof that is located relatively near the first end region of the annular space, and (ii) a second end region thereof that is located relatively near the second end region of the annular space;

e) providing confinement means for engaging, confining and compressing the quantity of elastomeric material within the annular space, with the confinement means including first and second structures that are movable along the center axis relatively toward and away from each other, with the first and second structures defining first and second clamping ring formations, respectively, (i) that are configured to extend into the first and second end regions of the annular space, respectively, when the first and second structures are moved along the center axis relatively toward each other, (ii) that are configured, to define opposed clamping surfaces that engage and clamp the first and second opposed end regions, respectively, of the elastomeric material when the first and second structures are moved relatively axially toward each other, and (iii) that are configured to cooperate with the inner and outer diameter surfaces to confine the elastomeric material to a "confinement chamber" which is a sleeve-like annular region that is bounded (i) at opposed ends by said opposed clamping surfaces, and (ii) at inner and outer diameters by the inner and outer diameter surfaces of the first and second components, respectively, whereby the confinement chamber defines a volume that is controllable as by moving the first and second clamping ring formations relatively toward and away from each other so as to selectively control the axial spacing between the opposed clamping surfaces; and,

f) operating the confinement means to diminish the volume of the confinement chamber so as to clamp and compress the quantity of elastomeric material within the confinement chamber, with the operating of the confinement means being effected by moving the first and second structures relatively toward each other to move the first and second clamping ring formations, relatively toward each other within the annular space (i) to bring the opposed clamping surfaces into engagement with the opposed first and second end regions of the elastomeric material, (ii) to diminish the volume of the confinement chamber by causing the opposed clamping surfaces to clampingly engage the quantity of elastomeric material therebetween such that the elastomeric material is caused to deform to such extent as may be needed to enable the quantity of elastomeric material to substantially fill the volume of the confinement chamber, and (iii) to diminish still further the volume of the confinement chamber by bringing the opposed clamping surfaces into progressively more forceful clamping engagement with the quantity of elastomeric material so as to cause the quantity of elastomeric material to behave much like a compressed fluid in the sense that the quantity of elastomeric material is caused to become "pressurized" within the confinement chamber such that the pressurized quantity of elastomeric material is caused to exert pressure forces (1) not only in substantially axial directions so as to oppose with increasing forcefulness continued axial clamping movement of the opposed clamping surfaces, (ii) but also in radially inwardly and radially outwardly extending directions so as to bring the elastomeric material into forceful engagement with the inner and outer diameter surfaces of the first and second components, respectively, with the radially directed pressure forces serving to assist in establishing frictional connections at interfaces between the elastomeric material and the inner and outer diameter surfaces of the first and second components, respectively;

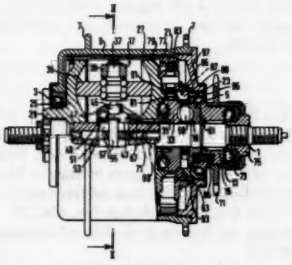
g) whereby a connection is formed between the first and second components.

5,069,655

DRIVING HUB FOR A VEHICLE

Ulrich Schievelbusch, Kassel, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Dec. 11, 1990, Ser. No. 625,909
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1989, 3940919
Int. Cl.[5] F16H 3/72
U.S. Cl. 475—186 11 Claims



1. A driving hub for a vehicle comprising a hub shaft (1), a hub sleeve (9) which surrounds the hub shaft (1) with the same axis and rotatably relative thereto, a driver (13) rotatably mounted relative to the hub sleeve (9), a friction gear (17) which is arranged inside the hub sleeve (9), comprises two axially opposed toroidal discs (25, 27) and several friction wheels (35) distributed in the circumferential direction of the toroidal discs (25, 27) and frictionally coupling the toroidal discs (25, 27) to one another, and is arranged in the force path between driver (13) and hub sleeve (9), wherein the friction wheels (35) are rotatably mounted on spindles (37) and the spindles (37), in turn, are pivotally mounted on a friction wheel carrier (43) via pivot axes (41) extending in the circumferential direction of the toroidal discs (25, 27), at least one coupling device (23) which closes the force path between driver (13) and hub sleeve (9) when the hub is driven by the driver (13) and opens the force path when the driver (13) is not driven, a manually actuable control device (47, 51, 53) which pivots the friction wheels (35) together round the pivot axes (41) for smooth adjustment of the step-up ratio of the friction gear (17), wherein

the driver (13) is also rotatably mounted relative to the hub shaft (1), the first (25) of the two toroidal discs (25, 27) is rigidly arranged on the hub shaft (1) on the side of the second (27) of the two toroidal discs axially removed from the driver (13) and the second toroidal disc (27) is non-rotatably coupled to the hub sleeve (9) at least in the driving direction of rotation, the friction wheel carrier (43) is rotatably mounted on the hub shaft (1) and is connected in terms of drive to the driver (13) and the control device (47, 51, 53) comprises a rod (53) guided inside the hub shaft (1) and a clutch ring (47, 51) which is articulated to the spindles (37) of the friction wheels, is guided on the hub shaft (1) and is displaceable along the hub shaft (1) by means of the rod (53).

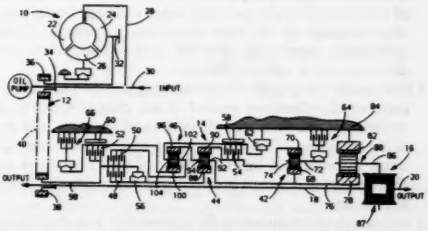
5,069,656

MULTISPEED POWER TRANSMISSION

James F. Sherman, Brighton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 25, 1991, Ser. No. 660,190
Int. Cl.[5] F16H 57/10, 57/08
U.S. Cl. 475—276 3 Claims

1. A power transmission comprising: input means for delivering power to the transmission including an input shaft and a plurality of selectively engageable input clutch means; output means for delivering power from the transmission including an output shaft; first, second and third planetary gear means each having a sun gear, a ring gear and planet carrier means having pinion gear means rotatably mounted thereon in meshing arrangement with the respective sun gears and ring gears; a plurality of selectively engageable brake means; said ring gear of the first planetary gear means, said planet carrier means of said second planetary gear means and said sun gear of the third planetary gear means being drivingly interconnected for unitary rotation with the output means; the sun gear of said second planetary gear means being operatively connected with a first of said input clutch means; the sun gear of said first planetary gear means being operatively connected with a second of said input clutch means and a first of said brake means; the planet carrier means of said first planetary gear means being operatively connected with a third of said input clutch means,



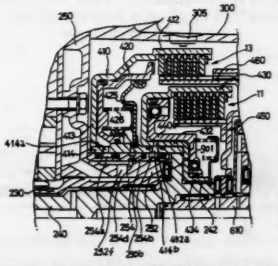
a second of said brake means and with an intermediate clutch means; the ring gear of the second planetary gear means being drivingly connected with the ring gear of the third planetary gear means and with said intermediate clutch means; and the planet carrier means of said third planetary gear means being connected with a third of said brake means; said input clutch means, said intermediate clutch means and said brake means being selectively operable to establish five forward gear ratios including a lowest gear ratio and one reverse gear ratio between the input means and the output means and said third planetary gear means being effective in only the lowest gear ratio.

5,069,657

AUTOMATIC TRANSMISSION

Takao Taniguchi; Kazumasa Tsukamoto; Masahiro Hayabuchi, and Koji Noda, all of Anjo, Japan, assignors to Aisin A W Kabushiki Kaisha, Anjo and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed May 3, 1990, Ser. No. 518,174
Claims priority, application Japan, May 10, 1989, 1-115101
Int. Cl.[5] F16H 57/10
U.S. Cl. 475—283 6 Claims



1. An automatic transmission having a change-speed transmission including a plurality of planetary gearsets and friction elements comprising:

a casing having a cylindrical supporting member provided integrally therewith and extended therefrom coaxially with a driving shaft,

a first drum having an outer cylinder, an inner cylinder and an annular wall portion connecting said outer and inner cylinders; said inner cylinder being formed in a form of a stepped cylinder having a larger-diameter cylinder connected to said annular portion, a smaller-diameter cylinder and an annular wall portion connecting said larger-diameter cylinder and smaller diameter cylinder; and said smaller-diameter cylinder being connected to said driving shaft,

a second drum having an outer cylinder disposed coaxially with and radially outwardly from said outer cylinder of said first drum, an inner cylinder disposed coaxially with and radially inwardly from said smaller-diameter cylinder of said first drum and an annular wall portion connecting said outer and inner cylinders;

said larger-diameter cylinder of said first drum being mounted on outer peripheral surface of said inner cylinder of said second drum; and said inner cylinder being rotatably mounted on an outer cylindrical periphery of said cylindrical supporting member and connected to said driving shaft at one end thereof,

a first clutch component for connecting and disconnecting a member of a planetary gearset of said change-speed transmission to and from said driving shaft through said first drum including a first clutch piston disposed between said outer cylinder and inner cylinder of said first drum and friction plates disposed inside of said outer cylinder of said first drum,

a second clutch component for connecting and disconnecting a member of a planetary gearset of said change-speed transmission to and from said driving shaft through said second drum including a second clutch piston disposed between said outer cylinder and inner cylinder of said second drum and friction plates disposed inside of said outer cylinder of said second drum, and

oil passages being formed in said cylindrical supporting member; one of said oil passages being communicated with a pressure chamber formed between said first clutch piston and said annular wall portion connected to said outer cylinder and said inner cylinder of said first drum through passages formed in said inner cylinder of said second drum and said larger-diameter cylinder of said first drum, respectively; and one of said oil passages being communicated with a pressure chamber formed between said second clutch piston and said annular wall portion of said second drum through a passage formed in said inner cylinder of said second drum.

5,069,658

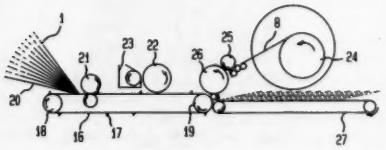
METHOD AND APPARATUS FOR MAKING DISPLAY BOXES HAVING WINDOWS

François Dupuy, Les Grands Moulins Bouex, 16410 Dignac, France

Continuation of Ser. No. 158,031, Jan. 12, 1988, Pat. No. 4,826,004, which is a continuation of Ser. No. 329,335, Dec. 10, 1981, abandoned. This application May 1, 1989, Ser. No. 346,448

Int. Cl.[5] B31B *1/82*

U.S. Cl. 493—59 **10 Claims**



1. Apparatus for making erectable display boxes of the type comprising a sheet of opaque material having groove lines and an opening therein and a sheet of substantially rigid transparent plastic material covering the said opening from a roll of substantially rigid transparent plastic material and a supply of sheets of opaque material having groove lines therein, said apparatus comprising means for receiving a roll of substantially rigid transparent plastic material, a roller assembly for receiving said plastic material from said roll, groove-forming means for forming groove lines in said plastic material, cutting means for cutting said plastic material into sheets having groove lines therein, opaque sheet feeding means for feeding sheets of opaque material having groove lines therein, positioning means for positioning a sheet of said plastic material in a desired juxtaposed relationship with a sheet of said opaque material such that the plastic material substantially covers the opening in the opaque material and the groove lines in the sheet of plastic material are aligned with groove lines in the sheet of opaque material, and means for adhering the juxtaposed sheets together.

5,069,659

APPARATUS FOR THE PRODUCTION OF SHOPPING BAGS HAVING REINFORCED HANDLE HOLES

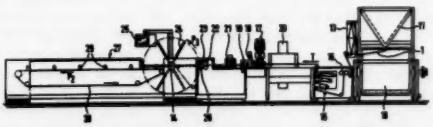
Franz Bochtler, Rudersberg, and Wilhelm Ley, Troisdorf, both of Fed. Rep. of Germany, assignors to Stiegler Maschinenfabrik GmbH, Rudersburg, Fed. Rep. of Germany

Filed Dec. 21, 1989, Ser. No. 454,278

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1988, 8815895[U]

Int. Cl.[5] B31B *23/86*

U.S. Cl. 493—194 **6 Claims**



1. An apparatus for the production of shopping bags made of thermoplastic synthetic resin, each bag having handles holes reinforced with welded-on reinforcing tabs made of thermoplastic synthetic resin film strips, said tabs surrounding the handle holes and being welded to sides of the bag, said apparatus comprising means for effecting cyclic stepwise advance of two film webs of thermoplastic synthetic resin forming the sides of each bag; feeding means for supplying two film strips of thermoplastic synthetic resin from which the reinforcing tabs are severed in a cyclic fashion with the advance of the film webs, said feeding means comprising a strip unwinding unit having feed rolls for the two film strips, a separating plate arranged between the two film strips for spacing apart the two film strips that are fed in superposition transversely to the advancing direction of the film webs, cutting means for severing the reinforcing tabs from the film strips, and a turntable rotatable about an axis perpendicular to the advancing direction of the film webs cyclically in synchronism with the stepwise advance of the film webs, said turntable having a portion projecting between the film webs and being equipped on a topside and a bottom side with holding places exposable to a vacuum for retaining the reinforcing tabs; a welding unit for welding the reinforcing tabs to the film webs being associate in each case on the topside and bottom side of the turntable with holding places extending farthest in between the film webs, holding places of the turntable for receiving the tabs being located outside of the film webs and adjoining the separating plate, an entrance gap being provided between the turntable and the separating plate; a punching unit for punching the handle holes into the welded-on tabs; and means for welding and severing of the shopping bags from the film webs transversely to the advancing direction of the film webs; the separating plate of the feeding means for the reinforcing tabs having, on the topside and the bottom side, grooves extending in the feeding direction of the film strips; drivable advancing rolls each provided with annular grooves and being associated with the topside and the bottom side, respectively, of the separating plate, each advancing roll cooperating with a counter roll

which is arranged in the separating plate and which has annular grooves arranged so that grooves of the advancing roll and grooves of the counter roll are in mutual opposition and form slotted chambers in alignment with grooves of the separating plate; and rods arranged in a self-supporting fashion, extending through the grooves of the separating plate, as well as through slotted chamber, one rod associated with each groove in each chamber and a draw-through slot for the film strips formed between the zones of maximum diameter of the advancing rolls and the counter rolls and a route reinforced by rack-shaped rods in the slotted chambers whereby an undulated discharge gap for the film strips is formed transversely to the feeding direction of the film strips and, as seen in the feeding direction, downstream of an end of the separating plate; said cutting means comprising two blades that can be moved up and down transversely to the feeding direction of the film strips, one blade being disposed above and another blade being disposed below the separating plate.

5,069,660

URETHRA PROSTHETIC FOR RELIEVING PROSTATIC PROBLEMS

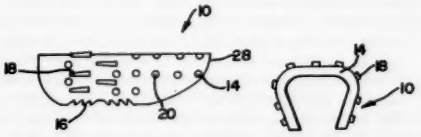
David S. Grantham, Lot 39, Hardingsdale, Pietermaritzburg, South Africa

Filed Dec. 7, 1989, Ser. No. 447,269

Claims priority, application South Africa, Dec. 9, 1988, 88/9247

Int. Cl.[5] A61F *2/02*

U.S. Cl. 600—30 **14 Claims**



1. A urethra prosthetic device for insertion in a urethra comprising a planar tongue-shaped body said body being made of resilient material to permit resilient deformation of two sides thereof to impart a channel-shaped profile to said body for maintaining an open lumen in a urethra.

5,069,661

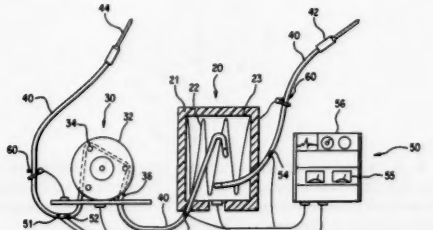
CIRCULATORY SUPPORT SYSTEM

Leonard A. Trudell, Warwick, R.I., assignor to Brigham and Women's Hospital, Boston, Mass.

Filed May 18, 1988, Ser. No. 195,594

Int. Cl.[5] A61M *37/00*

U.S. Cl. 604—4 **21 Claims**



1. A fluid circulation and oxygenation system, comprising:
a first cannulation;
means for oxygenating a fluid circulating in said system, connected to said first cannulation;
a pump, connected to said oxygenating means, said pump including a pump tube that is positioned higher than an inlet and an outlet of said pump to thereby trap air bubbles in the fluid; and
a second cannulation, connected to said pump.

5,069,662

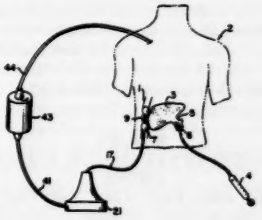
CANCER TREATMENT

William L. Bodden, Branford, Conn., assignor to Delcath Systems, Inc., New York, N.Y.

Filed Oct. 21, 1988, Ser. No. 260,623

Int. Cl.[5] A61M *1/00*

U.S. Cl. 604—4 **5 Claims**



1. In a process for perfusing a high concentration of an agent through a body organ requiring treatment without contaminating the body's general circulation, the improvement comprising:
percutaneously inserting a single catheter having spaced balloons into the inferior vena cava of a body in which an organ is to be treated by perfusing a high concentration of a treating agent, said catheter being moved to a position in which inflation of the spaced balloons isolate effluent blood from the organ from the body's general circulation, said catheter having a lumen for removing blood derived from said organ;
inflating the balloons to isolate said effluent blood;
removing from the body through said lumen in said catheter essentially all of the effluent blood from said organ, said effluent blood containing said agent;
treating removed effluent blood to reduce the quantity of treating agent; and
returning the thus treated blood to the body via the superior vena cava, a subclavian vein, a jugular vein or the right atrium.

5,069,663

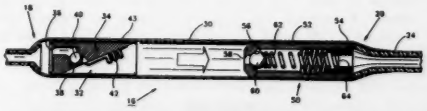
HYDROCEPHALUS VALVE

Marvin L. Sussman, Miami, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.

Continuation of Ser. No. 443,058, Nov. 28, 1989, abandoned, which is a continuation of Ser. No. 255,790, Oct. 11, 1988, abandoned. This application Apr. 4, 1991, Ser. No. 681,414

Int. Cl.[5] A61M *27/00*

U.S. Cl. 604—9 **6 Claims**



1. Valve apparatus for use in routing cerebrospinal fluid away from the brain at a controlled pressure; said valve apparatus comprising an implant defining a chamber having an inlet and an outlet, said inlet for routing cerebrospinal fluid from the brain into the chamber and said outlet for routing said cerebrospinal fluid from the chamber to a drainage location within a subject; said implant comprising
i) an inlet value located at an inlet end of the chamber to

allow cerebrospinal fluid to enter the chamber and to impede reverse flow of the cerebrospinal fluid from the chamber, said inlet valve comprising an inlet valve body that defines a seat, a ball that moves toward and away from said seat in response to fluid passing through said inlet valve and a corrugated cantilever spring attached at one end to the inlet valve body and having a ball engaging surface at an opposite end of said spring tending to hold the ball against said seat; and

ii) an outlet valve located downstream from the inlet valve and comprising an outlet valve body defining a outlet valve seat, a ball dimensioned to close off the outlet valve seat, and a coiled spring trapped between the ball and the control valve body to bias the ball against the outlet valve seat and means for adjusting the length of the coiled spring between the ball and a shoulder that engages the coiled spring to regulate the pressure of the fluid passing from the chamber through the chamber outlet.

5,069,664

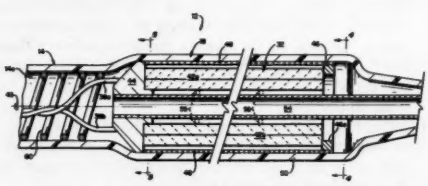
INTRAVASCULAR ULTRASONIC ANGIOPLASTY PROBE

Joe F. Guess, Estes Park, Colo., and Paul J. Zalesky, Huntington Beach, Calif., assignors to Inter Therapy, Inc., Costa Mesa, Calif.

Filed Jan. 25, 1990, Ser. No. 469,770

Int. Cl.[5] A61B *17/32*

U.S. Cl. 604—22 **18 Claims**



1. An probe for ultrasonically removing unwanted biological tissue comprising an elongate probe assembly having proximal and distal end portions, and a transducer subassembly located near said distal end portion of said probe assembly, wherein said transducer subassembly includes:

transducer means having a predetermined length dimension and adapted to vibrate at ultrasonic frequencies in response to electrical driving signals;

elongate ultrasonic horn means positioned laterally adjacent to said transducer means and aligned substantially parallel to said length dimension thereof;

coupling means rigidly coupling the proximal ends of said transducer means and said ultrasonic horn means one to another so as to allow said vibratory displacements of said transducer means to be transferred to said horn means; and

flexible wire means operatively connected to and distally extending from said horn means so that said vibratory displacements of said horn means are responsively transferred to said wire means, wherein said wire means includes a terminal end portion adapted to contact said unwanted biological tissue and to remove the same by means of said responsive vibratory displacements thereof.

5,069,665

FLUID ASPIRATION NEEDLE

Raymond C. Ng, 1737 Oak Grove, San Marino, Calif. 91108

Filed Jul. 2, 1990, Ser. No. 546,896

Int. Cl.[5] A61M *31/00*

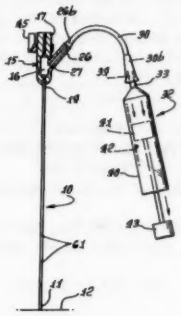
U.S. Cl. 604—51 **8 Claims**

1. In a fluid aspiration needle assembly, the combination comprising:

a) a linearly elongated tubular needle having a first end to be positioned at or proximate a patient's body, and an opposite end portion,

b) an enlarged hub integral with said opposite end portion of the needle and providing a reservoir, the hub having a first duct in linear communication with the needle via said reservoir, and there being a second duct in communication with the reservoir and branching relatively away from the first duct, the second duct connected to the hub,

c) the first duct, reservoir and needle being in linear alignment to receive an elongated stylet having a sharp end, and manipulable to cause said sharp end to penetrate the



patient's body, and to be withdrawn so that body fluid can pass through the needle and enter the reservoir,

d) and flexible, coupler tubing operatively connected to said second duct for passing fluid between the reservoir and a syringe operatively connected to said reservoir via said flexible tubing, whereby the syringe may be bodily manipulated in force-transmitting isolation relative to the needle, and including said syringe removably connected to said flexible tubing, remote from the reservoir,

e) there being a stopper at said hub first duct and operable to close said first duct, after withdrawal of the stylet from the needle.

5,069,666

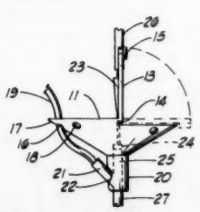
INTRAVENOUS ADMIXTURE PROTECTIVE DEVICE

Stephen H. Gericke, Oklahoma City, Okla., assignor to Safe Medical Devices Inc., Oklahoma City, Okla.

Filed Feb. 8, 1991, Ser. No. 652,990

Int. Cl.[5] A61M *37/00, 5/00*

U.S. Cl. 604—86 **14 Claims**



1. A protective apparatus of the type to be positioned in surrounding relationship with a conventional intravenous admixture port assembly containing an injection port branch, said protective apparatus comprising:

(a) an elongated cylindrical member of a predetermined length sufficient to extend beyond the injection port branch of said admixture port, said cylinder comprising an internal diameter dimensioned slightly larger than the outer diameter of the injection port branch of said admixture port,

(b) entrance means comprising an integrally formed opening

at the distal end of said cylindrical member, dimensioned to pass over the injection port branch of said admixture port,

(c) locking means integrally formed on said cylindrical member adjacent said entrance means to selectively engage or disengage said cylindrical member with or from said admixture port,

(d) said locking means comprising a dimensionally reduced slotted opening interposed between said dimensioned opening for the admixture port assembly and the distal end of said cylinder,

(e) said slotted opening comprising at the distal portion thereof, relief in the form of rounded corners, to facilitate passage over the admixture port through slight deformation of said dimensionally reduced slotted opening,

(f) said cylindrical member comprising at the upper portion thereof an integrally formed conical shield constructed of a durable plastic material,

(g) said shield being in the form of a truncated cone, said cone being fixedly attached, at the frustum thereof to the upper end of said cylindrical member in the manner of a funnel,

(h) said cone comprising adjacent to the periphery thereof a dimensioned hole,

(i) said hole having a narrow slot interposed between it, and communicating with, the outer periphery of said cone,

(j) said conical shield having for half the circumference thereof a semi-detached member, said member being integrally formed and attached to said cone by diametrically opposed hinge members which allow upward rotation of said semi-circular semi-detached member to achieve perpendicularity with relation to the base of said cone,

(k) said semi-circular semi-detached member having at mid-point thereof, an additional semi-circular portion comprising at least 190° of arc, said portion being open for the remaining 170°,

(l) said 190° semi-circular portion being dimensioned to accommodate standard intravenous tubing,

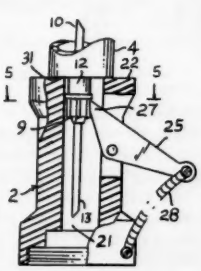
(m) said conical shield having within the periphery thereof, at a point proximate the mid-point between the base of said cone and the frustum thereof, at least one dimensioned hole.

5,069,667

DEVICE FOR EFFECTING SAFE REMOVAL OF A USED NEEDLE

Lawrence F. Freundlich, 923 N. First St., New Hyde Park, N.Y. 11040, and Arthur Karmen, 110 Colonial Pkwy., Manhasset, N.Y. 11030

Filed Jul. 24, 1990, Ser. No. 556,964
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—110 **5 Claims**



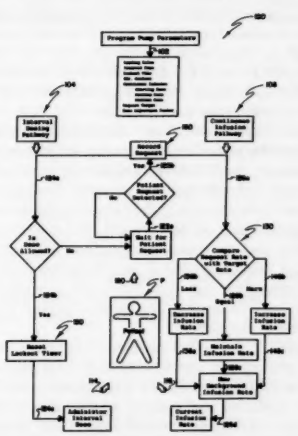
1. A device for removing from a syringe a used needle which has been screwed into the syringe and which needle has a straight splined portion disposed externally of the syringe, the device comprising: an upper member for effecting removal of the needle, the upper member being removably engaged over the open top of a disposable container lower member, into which container the needle may drop when removed, wherein the upper member has a narrow vertically extending elongated body provided with an open-ended vertical passage through it communicating with the open top end of the disposable container, a cam lever pivotably mounted between opposed vertical side walls of a vertically extending slot that opens through a side of the body into the passage, the cam lever having a cam end surface that is movable into the passage to restrict the passage accordingly as the cam lever is pivoted in one direction and is movable clear of the passage accordingly as the cam lever is pivoted in an opposite direction, spring means biasing the cam lever in the direction in which its cam surface restricts the passage, and the cam lever being manually actuable in the opposite direction against the bias of the spring means to move its cam surface clear of the passage, and wherein the passage is adapted upon movement of the cam surface clear of the passage to have a needle of a syringe with the splined portion of the needle entered into the passage, and the cam lever is adapted upon being manually released to enter under bias of the spring means its cam surface into the passage into engagement with the splined portion so as to restrain the position of the entered needle to allow the syringe to be unscrewed from the needle, and wherein the cam lever is adapted upon its cam surface being subsequently manually pivoted clear of the passage and of the needle to allow the needle from which the syringe has been unscrewed to drop down the passage into the disposable container below.

5,069,668

PATIENT CONTROLLED ANALGESIA SYSTEM

Scott A. Boydman, 25447 Bryden Rd., Beachwood, Ohio 44122

Filed Jul. 12, 1990, Ser. No. 551,886
Int. Cl.[5] A61M 5/00
U.S. Cl. 604—121 **25 Claims**



1. A method of administering liquid medicine such as analgesia to a patient as by infusion, comprising the steps of:

a) providing dispensing means having a reservoir for liquid medicine such as analgesia, a tube for delivering the liquid medicine to a patient as by infusion, and pre-settable dispensing means for controllably dispensing a flow of the liquid medicine from the reservoir into the tube, with the pre-settable dispensing means including control means for being operated to input control commands to the pre-settable dispensing means so as to regulate the dispensing of the liquid medicine from the reservoir into the tube, with the control means further including a patient demand control that is operable by a patient who is to be infused with the liquid medicine to register a need felt by the patient for the flow of medicine to continue to be dis-

pensed, and with the control means also being operable to record the operations of the demand control by the patient so that decisions concerning the flow of dispensed liquid medicine can be made based, at least in part, on the record of felt need that has been registered by the patient as by operating the demand control;

b) dispensing liquid medicine from the reservoir through the tube for infusion delivery to the patient at an initial rate of flow, with the initial rate of flow residing within a predetermined range of acceptable flow rates that is bounded by an upper limit beyond which the dispensed flow rate is not to be permitted to rise, and by a lower limit beyond which the dispensed flow rate is not to be permitted to fall;

c) determining a predetermined target number of operations of the demand control per unit of measured time that is to be utilized to maintain an existing rate of flow of liquid medicine dispensed through the tube, and maintaining the then existing rate of flow of liquid medicine being delivered as by infusion to the patient so long as the actual number of operations of the demand control per unit of measured time equals the predetermined target number;

d) determining a first increment in rate of flow of dispensed medicine by which the existing flow rate of dispensed liquid medicine is to be increased in the event that the actual number of operations of the demand control per unit of measured time exceeds the target number by a first predetermined value, and, increasing the rate of flow of dispensed medicine by said first increment of flow rate in response to determining that the actual number of operations of the demand control per unit of measured time exceeds the target number by at least said first predetermined value;

e) determining a second increment in rate of flow of dispensed medicine by which the existing flow rate of dispensed liquid medicine is to be decreased in the event that the actual number of operations of the demand control per unit of measured time falls short of the target number by a second predetermined value, and, decreasing the rate of flow of dispensed medicine by said second increment of flow rate in response to determining that the actual number of operations of the demand control per unit of measured time falls short of the target number by at least said second predetermined value; and,

f) continuing to dispense liquid medicine to the patient for infusion as by periodically adjusting the existing flow rate of dispensed medicine if variances between the actual number of operations of the demand control per unit of measured time exceeds or falls short of the target number by said first and second values, respectively, but with increases and decreases in said flow rate of dispensed medicine being curtailed as may be necessary to maintain the existing flow rate at all times within a predetermined range of safe values for flow rates to be used in dispensing medicine to the patient;

g) whereby, if the actual number of operations of the demand control per unit of measured time falls off due to sedation or diminished need of the patient, the flow rate at which medicine is dispensed to the patient by infusion likewise will diminish to insure safety and to conform the flow rate of medicine delivery to the minimal actual need of the client, but is maintained within said range of safe values for flow rates.

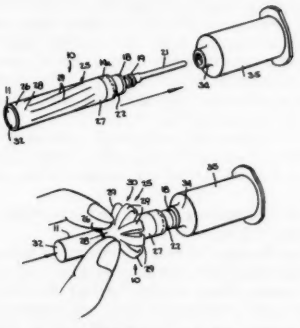
5,069,669

EXPANDABLE FINGER GUARD FOR A HYPODERMIC NEEDLE CAP

Richard L. Kole, New Hempstead, N.Y., assignor to Design Opportunity Corp., New City, N.Y.

Filed Dec. 11, 1989, Ser. No. 448,674
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—198 **3 Claims**

3. A finger guard for a double pointed multiple sample hypodermic needle assembly wherein said needle assembly has first and second hollow needles projecting in opposite directions along a common longitudinal axis from an intermediate body structure which body structure has a generally centrally located radial flange, an externally threaded extension on one side of said flange, and a cap-engaging extension on the other side of said flange; a first cap enclosing said first hollow needle and engaging said cap engaging extension; and a second cap enclosing siad second hollow needle and said externally threaded extension and telescoped over said radial flange; said finger guard comprising a tubular element of flexible needle-



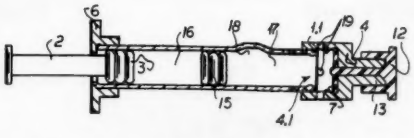
puncture-resistant material having first and second circumferentially continuous end sections joined by a plurality of longitudinally extending circumferentially contiguous strips which strips, when said end sections are urged axially toward one another, project radially to form an umbrella-like structure, said first end section being secured about and to said first cap in the vicinity of the open end of said first cap with said second end section being axially slidable and rotatable relative to said first cap.

5,069,670

HYPODERMIC SYRINGE

Helmut Vetter, Ravensburg, and Peter Gepräigs, Weingarten, both of Fed. Rep. of Germany, assignors to Arzneimittel GmbH Apotheker Vetter & Co., Ravensburg, Fed. Rep. of Germany

Filed Sep. 6, 1990, Ser. No. 578,731
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—243 **8 Claims**



1. A hypodermic syringe comprising:

a generally cylindrically tubular body extending along an axis and having an axial front end formed with a radially outwardly projecting annular bead, the body having a rear end provided with a finger-rest crosspiece;

a piston axially displaceable in the body and provided with a plunger projecting axially out the rear end past the crosspiece, the crosspiece being internally threaded and the plunger having a complementarily externally threaded front portion threadedly engageable in the crosspiece and a small-diameter rear portion slidable axially through the crosspiece;

a plug having a rearwardly directed flange fitting complementarily over the front end of the body at the bead and forwardly blocking the body; and

a flat soft seal ring compressed axially between the plug and the front end of the body;

5,069,671

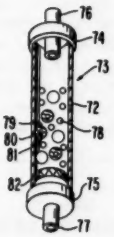
INTRAVENOUS MEDICATION

Felix Theeuwes, Los Altos, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Continuation of Ser. No. 664,802, Oct. 25, 1984, Pat. No. 4,790,820, which is a continuation-in-part of Ser. No. 576,929, Feb. 3, 1984, abandoned, which is a division of Ser. No. 377,831, May 13, 1983, Pat. No. 4,439,183, which is a continuation-in-part of Ser. No. 310,047, Oct. 9, 1984, Pat. No. 4,511,353, which is a continuation-in-part of Ser. No. 283,077, Jul. 13, 1981, abandoned. This application Jun. 23, 1988, Ser. No. 210,539

Int. Cl.[5] A61M *5/14*

U.S. Cl. 604—251 11 Claims



1. A formulation chamber for use in a parenteral delivery system, comprising:

(a) a wall surrounding a lumen;

(b) an inlet for admitting a fluid into the chamber;

(c) an outlet for letting fluid leave the chamber; and,

(d) a plurality of tiny pills in the chamber, the tiny pills comprising:

(1) particles of parenterally administrable different drugs; and,

(2) a wall surrounding the parenterally administrable drugs, the wall formed of a parenterally acceptable material that releases the parenterally acceptable drugs from the tiny pills into a parenterally acceptable fluid that enters the formulation chamber and contacts the tiny pills.

5,069,672

REUSABLE DIAPER

Heather Wippler, 29 Hartsfield Drive, Bowmanville, Ontario, L1C 4A6, Canada, and Leopole Nolet, 2951 Highway 7 West, Unit 4, Concord, Ontario, L4K 1W3, Canada

Filed Sep. 21, 1990, Ser. No. 586,149

Claims priority, application Canada, Jun. 21, 1990, 2019560

Int. Cl.[5] A61F *13/15, 13/20*

U.S. Cl. 604—385.1 12 Claims

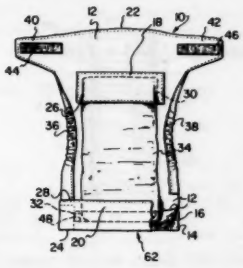
1. A reusable diaper comprising:

(a) inner and outer substantially rectangular layers of absorbent material;

(b) a liquid impervious layer between said inner and outer layers;

(c) opposed first and second pockets on said inner layer, said pockets having open sides oriented toward each other; and

(d) at least one absorbent insert in an area between said pockets, said insert having opposite ends inserted into respective ones of said open sides of said pockets, and said insert comprising a single sheet folded along a fold line to



form at least two layers, said layers secured to each other only along said fold line.

5,069,673

CATHETER WITH DOUBLE STEP-DOWN BORE

Jacqueline A. Shwab, Miami, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.

Filed Feb. 7, 1989, Ser. No. 475,938

Int. Cl.[5] A61M *25/00*

U.S. Cl. 604—280 15 Claims

1. A catheter which defines a flexible, tubular body and a tubular tip carried at the distal end of said body, at least the majority of said tubular body defining a first bore portion having a first diameter; said catheter defining side holes adjacent said distal end, said catheter defining a second bore portion distal to essentially all of said side holes present and having a second diameter which is less than the first diameter; said catheter also defining an intermediate, tubular portion between the first and second bore portions, said intermediate portion having a third bore diameter that is less than the first diameter and greater than the second diameter, said intermediate portion defining a thicker catheter wall than the catheter wall defining the first bore portion.

5,069,674

FLEXIBLE, KINK-RESISTANT CATHETER

Neal E. Fearnot, and Richard B. Sisken, both of West Lafayette, Ind., assignors to Medical Engineering and Development Institute, Inc., West Lafayette, Ind.

Continuation-in-part of Ser. No. 275,435, Nov. 23, 1988, Pat. No. 4,985,022. This application Dec. 29, 1989, Ser. No. 458,610

Int. Cl.[5] 7A61 *25/00*

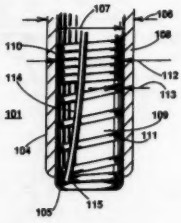
U.S. Cl. 604—282 20 Claims

1. A catheter for insertion into biological tissue, comprising:

a tubular sheath having a longitudinal passageway therein capable of transporting a fluid to said tissue and a minimum predetermined strength capable of maintaining a predetermined flow rate of said fluid within said passageway when said sheath is flexed; and

an elongated coil having a first plurality of closely-coupled turns and expansion friction-fitted and longitudinally

movable within said longitudinal passageway of said tubular sheath, said coil distributing radial and longitudinal



forces over said sheath without rupturing said sheath when said sheath is flexed.

5,069,675

APPLICATOR FOR LIQUID EYE PREPARATIONS

Jehoshua Menchel, and Malka Menchel, both of 23, Yakinton Street, Yavne 70600, Israel

Continuation of Ser. No. 379,610, Jul. 13, 1989, Pat. No. 4,968,310. This application Jul. 26, 1990, Ser. No. 558,219
Claims priority, application Israel, Jun. 27, 1989, 90763
The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.
Int. Cl.[5] A61M *35/00*
U.S. Cl. 604—295 **8 Claims**

8. An eye liquid dispensing assembly comprising a bottle and an eye liquid applicator adapted to be mounted on the opening of said bottle, said applicator comprising a hollow body having a cylindrical wall portion opened at one end and an end wall portion at the opposite end, and said applicator further comprising an integral laterally protruding rigid spout comprising base situated in a lateral part of said applicator adjacent to the zone of contact between said cylindrical and said end wall portions, a part of said end wall portion not being adjacent to the base of said spout being resiliently flexible and all other parts of said end wall portion and cylindrical wall portion being non-resilient.

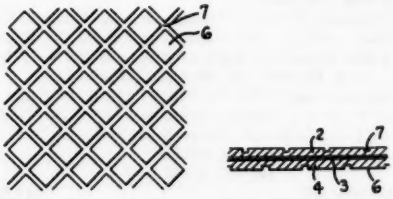
5,069,676

SANITARY ARTICLE

Osamu Ito, Utsunomiya, and Hiroshi Mizutani, Yachiyo, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 714,153, Mar. 20, 1985, abandoned. This application Aug. 7, 1987, Ser. No. 83,918
Claims priority, application Japan, Apr. 4, 1984, 59-67023
Int. Cl.[5] A61F *13/15*
U.S. Cl. 604—358 **7 Claims**

1. A sanitary article for absorbing body fluids, comprising a compressed assembly consisting essentially of an upper fluff pulp layer, a lower fluff pulp layer and a core layer of super water-absorbing polymer disposed between and retained by said fluff pulp layers and providing the principal absorbent of the sanitary article, the lateral edges of said core layer being spaced laterally inwardly from the lateral edges of said fluff pulp layers so that the entirety of said core layer is covered by said fluff pulp layers, both of said fluff pulp layers being compressed so as to have an indented lattice pattern on the surfaces thereof remote from said core layer, said surfaces each being comprised of a multitude of compressed small lands which are separated from each other by compressed, criss-crossing, continuous, indented strips wherein each of said lands is sur-



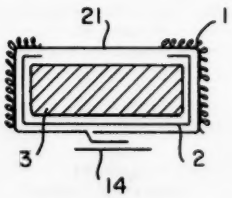
rounded by strips, said lands collectively defining first portions of said fluff pulp layers and having a density of from 0.04 to 0.015 g/cc, said indented strips collectively defining second portions of said fluff pulp layers and having a density higher than the density of said first portions and in the range of from 0.06 to 0.4 g/cc, the areas of said fluff pulp layers that are occupied by said second portions being from 10 to 50 percent of the total areas of said fluff pulp layers.

5,069,677

ABSORBENT ARTICLE

Akira Sakurai, Utsunomiya, and Yasuhiro Torimae, Wakayama, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Continuation of Ser. No. 201,364, May 25, 1988, abandoned, which is a continuation of Ser. No. 829,155, Feb. 14, 1986, abandoned. This application Mar. 12, 1990, Ser. No. 492,328
Claims priority, application Japan, Feb. 15, 1985, 60-27891; Feb. 15, 1985, 60-27892; Feb. 15, 1985, 60-27893; Jun. 21, 1985, 60-135660
Int. Cl.[5] A61F *13/15, 13/20*
U.S. Cl. 604—370 **5 Claims**



3. A method of preparation of an absorbent sanitary article which comprises:

providing an absorbent material to be used as an absorbent in an absorbent sanitary article, a leakproof sheet of material to be used to substantially surround said absorbent material and a surface sheet of material to ultimately encase said absorbent and leakproof materials,

fixing to respective surfaces of at least one of said absorbent material, leakproof sheet of material and surface sheet of material by fiber welding a hydrophobic, thermoplastic porous fiber such that said fiber is in direct contact with said respective surfaces,

and fabricating said absorbent sanitary article by substantially surrounding said absorbent material with said leakproof sheet and thereafter encasing said resulting composite with said surface sheet.

5,069,678

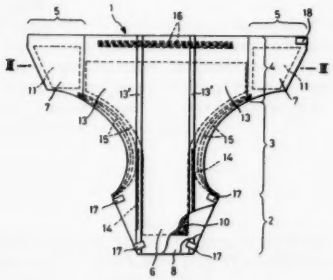
DISPOSABLE DIAPERS

Masamitsu Yamamoto, Kawanoe; Noriyuki Kimura, Iyomishima; Yoshihisa Fujioka, Kagawa; Hiroki Yamamoto, and Makoto Suekane, both of Kawanoe, all of Japan, assignors to Uni-Charm Corporation, Ehime, Japan

Filed Sep. 27, 1990, Ser. No. 588,759

Int. Cl.[5] A61F *13/15*

U.S. Cl. 604—385.1 **2 Claims**



1. A disposable diaper that comprises

(A) a first central portion having two sides that consists of

(a) a front area (2), a back area (4) and a crotch area (3) that connects said front and back areas,

(b) a liquid-permeable topsheet (6) covering one side of said first central portion and which is adapted to be placed against the body of the wearer,

(c) a liquid-impermeable backsheet (8) covering the other side of said first central portion and which is not adapted to be placed against the body of a wearer, and

(d) a first liquid absorbent core (10) sandwiched between said topsheet (6) and said backsheet (8),

(B) two spaced apart wing portions (5)

(a) each wing portion extending laterally outwardly from opposite sides of the back area (4) of said first central portion,

(b) each wing portion being composed of a second liquid absorbent core (11) sandwiched between two liquid permeable sheets (7, 9),

(C) first fastening means (18) associated with said wing portions (5) so that when the wing portions (5) are folded toward each other they can be fastened to each other in an overlapping relationship, and

(D) second fastening means (17) on said first central portion so that after said wing portions (5) have been fastened to each other in an overlapping relationship by fastening means (18) said front area (2) can be fastened to said back area (4) with the overlapped wing portions (5) therebetween.

5,069,679

METHOD AND APPARATUS FOR REMOVING VENOUS VALVES

Syde A. Taheri, 268 Dan Troy, Williamsville, N.Y. 14221

PCT No. PCT/US89/00634, § 371 Date Nov. 13, 1989, § 102(e) Date Nov. 13, 1989, PCT Pub. No. WO89/09029, PCT Pub. Date Oct. 5, 1989

PCT Filed Feb. 16, 1989, Ser. No. 435,517

Int. Cl.[5] A61B *17/32*

U.S. Cl. 606—159 **25 Claims**

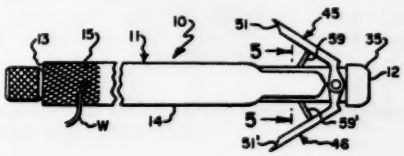
1. A valvulectome adapted for use in excising a venous valve, comprising:

an elongated probe having one end adapted to be inserted generally longitudinally into a vein, having another end adapted to remain outside said vein, and having an outer surface extending between said ends;

recess means forming a recess extending into said probe from said outer surface adjacent said one end;

a blade member having one end pivotally connected to said probe, said blade member having a cutting edge arranged at another end thereof to face toward said probe other end;

actuating means mounted on said probe and selectively



operable to cause said blade member to move relative to said probe between an outwardly-extended position in which said cutting edge is arranged outwardly beyond said outer surface, and an inwardly-retracted position in which said cutting edge is arranged within said recess;

whereby, when said blade member is in such retracted position, said cutting edge thereof will not extend outwardly beyond said outer surface, such that said probe may be moved longitudinally relative to said vein without causing undue damage to the endothelial tissue of said vein.

5,069,680

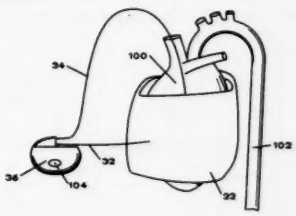
MUSCLE STIMULATOR WITH VARIABLE DUTY CYCLE

Pierre-Andre Grandjean, Bassenge, Belgium, assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Dec. 6, 1989, Ser. No. 446,794

Int. Cl.[5] A61M *1/10*

U.S. Cl. 623—3 **9 Claims**



1. Apparatus comprising:

a. a surgically prepared skeletal muscle adapted to be mechanically coupled to a natural human heart having ventricles which contract at a ventricular rate such that contraction of said surgically prepared skeletal muscle assists said natural human heart;

b. means responsively coupled to said natural human heart and said surgically prepared skeletal muscle for stimulating said skeletal muscle in synchrony with contraction of said ventricles of said natural human heart, said stimulation having parameters including pulse amplitude, duty cycle, pulses per burst, pulse width, and pulse interval; and

c. means responsively coupled to said stimulating means and adapted to be connected to a human body for sensing anticipated cardiac demand.

5,069,681

PROCESS FOR THE PHOTOCHEMICAL STABILIZATION OF DYED POLYAMIDE FIBRES WITH FOAMED AQUEOUS COMPOSITION OF COPPER ORGANIC COMPLEXES

Thys Bouwknegt, Reinach, Switzerland, and Claude Dietz, St. Louis-la-Chaussée, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 26, 1990, Ser. No. 633,832
Claims priority, application Switzerland, Jan. 3, 1990, 10/90
Int. Cl.[5] D06P *5/02*
U.S. Cl. 8—442 24 Claims

1. A process for the photochemical stabilisation of dyed polyamide fibre materials, which comprises treating the dyed material with a foamed aqueous composition which contains at least (a) a non-dyeing copper complex of bisazomethines, acylhydrazones, semicarbazones or thiosemicarbazones of aromatic aldehydes or ketones or oximes.

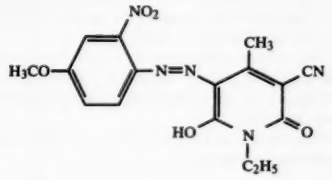
5,069,682

COLOR-STABLE BETA-MODIFICATION OF A MONOAZO DYE, A PROCESS FOR ITS PREPARATION, AND ITS USE

Rudolf Binder, Maintal; Friedrich Schophoff, and Klaus Hofmann, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 21, 1990, Ser. No. 631,900
Claims priority, application Fed. Rep. of Germany, Jan. 10, 1990, 4000529
Int. Cl.[5] C09B *67/02, 67/48;* D06P *1/18*
U.S. Cl. 8—526 8 Claims

1. β-Modification of the dye of the formula I



(I)

whose X-ray diffraction diagram (Cu-Kα radication) has the following lines at diffraction angles 2Θ (°):

Lines of high intensity:	11.57, 24.93, 28.09;
Lines of medium intensity:	8.23, 15.52, 18.85, 20.27;
Lines of low intensity:	13.99, 19.35, 21.45.

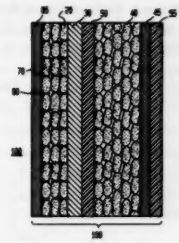
5,069,683

PROCESS OF MAKING A RECHARGEABLE BATTERY

Rosamaria Fong, Richmond; Harith Al-Janby, North Delta, and Jeffrey R. Dahn, Surrey, all of Canada, assignors to Moli Energy Limited, Canada

Division of Ser. No. 350,396, May 11, 1989, Pat. No. 5,028,500.
This application Feb. 13, 1991, Ser. No. 654,814
Int. Cl.[5] H01M *10/38*
U.S. Cl. 29—623.1 8 Claims

1. A process of making an electrochemical cell comprising the steps of intercalating an alkali metal into a composition including carbon having a degree of graphitization above about 0.40, at least a portion of said intercalating step being performed at a temperature above about 50° C., forming said composition into a first electrode and assembling said first electrode with a counterelectrode capable of reversibly incorporating said alkali metal and an electrolyte including a salt of said alkali metal in a cell housing.



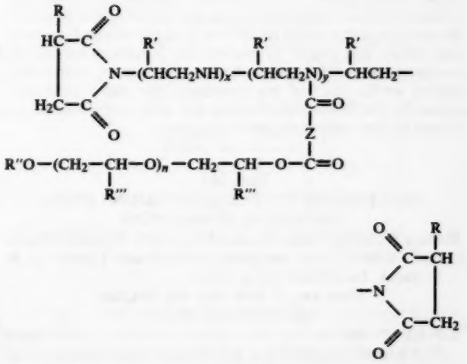
5,069,684

FUEL AND LUBE ADDITIVES FROM POLYETHER DERIVATIVES OF POLYAMINE ALKENYL SUCCINIMIDES

David A. Blain, Mt. Laurel, and Angeline B. Cardis, Florence, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 18, 1989, Ser. No. 452,074
Int. Cl.[5] C10L *1/22*
U.S. Cl. 44—331 15 Claims

1. A fuel composition containing a base fuel medium and an amount sufficient of an additive compound of the following structure to provide dispersant or detergent properties thereto:

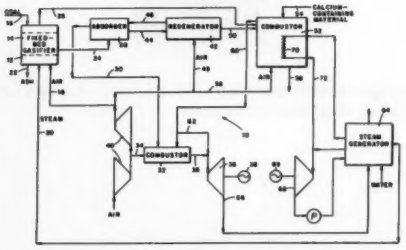


wherein x, y and n are integers, y is at least 1, x+y is from 1 to 10, and n is from 1 to 100; and were R is an alkyl or alkenyl group containing from 8 to about 10,000 carbon atoms, R' is H or C_1 to C_6 alkyl, R'' is an alkyl, aryl, alkylaryl, or arylalkyl containing 1 to 100 carbon atoms, R''' is hydrogen or an alkyl, aryl, alkaryl, or arylalkyl containing 1 to 100 carbon atoms; and wherein Z is the arylidene or alkylarylidene moiety of a dicarboxylic acid.

5,069,685
TWO-STAGE COAL GASIFICATION AND DESULFURIZATION APPARATUS

Larry A. Bissett, and Larry D. Strickland, both of Morgantown, W. Va., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 3, 1990, Ser. No. 562,298
Int. Cl.[5] C10J *3/20, 3/84, 3/86*
U.S. Cl. 48—77 **12 Claims**



1. A coal gasification system comprising a fixed-bed gasifier, combustion means, first conduit means in registry with said gasifier at a location therein overlying the fixed bed in the gasifier and coupled to said combustion means for conveying a stream of tar- and sulfur-containing fuel gas into said combustion means, means for introducing air into said combustion means for the combustion of the fuel gas therein, sulfur sorbing means containing regeneratable sulfur-sorbent material, second conduit means in registry with the fixed bed in the gasifier at a location underlying the first mentioned location and with said sulfur sorbing means for conveying a stream of sulfur-bearing fuel gas into contact with the sulfur-sorbent material for extracting sulfur species from the sulfur-bearing fuel gas, sorbent regenerating means adapted to receive sulfur-sorbent material containing the extracted sulfur species, third conduit means adapted to convey a stream of sorbent regenerating gas into said sorbent regenerating means and through sulfur sorbent material therein containing the extracted sulfur species for producing gaseous sulfur oxides by the regeneration of the sulfur-sorbent material and receiving therein said gaseous sulfur oxides, fourth conduit means adapted to convey the stream of sorbent regeneration gas and sulfur oxides received therein from said sorbent regenerating means into said combustion means, and means for introducing a calcium-containing compound into said combustion means for reacting with sulfur species within the fuel gas conveyed into said combustion means by the first conduit means and with sulfur oxides received by the sorbent regenerating gas.

5,069,686
PROCESS FOR REDUCING EMISSIONS FROM INDUSTRIAL STERILIZERS

Richard W. Baker, Palo Alto, and Johannes G. Wijmans, Menlo Park, both of Calif., assignors to Membrane Technology & Research, Inc., Menlo Park, Calif.

Filed Aug. 7, 1990, Ser. No. 564,030
Int. Cl.[5] B01D *53/22*
U.S. Cl. 55—16 **36 Claims**

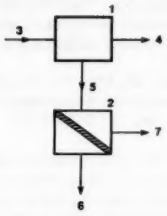
1. A process for treating a gas mixture including a sterilant gas and a diluent gas, comprising:

(a) feeding said gas mixture to a first separation process to substantially remove said sterilant from said gas mixture;

(b) withdrawing a treated gas stream from said first separation process;

(c) feeding said treated gas stream to a second separation process, comprising passing at least a portion of said treated gas stream through a membrane separation unit containing a permselective membrane;

(d) withdrawing from said separation unit a first stream enriched in said diluent gas compared with said gas mixture;



(e) withdrawing from said membrane separation process a second stream depleted in said diluent gas compared with said gas mixture.

5,069,687
PROCESS OF RECOVERY OF MALEIC ANHYDRIDE FROM REACTION GASEOUS MIXTURES

Aldo Bertola, Milan, and Roberto Ruggieri, Basiglio, both of Italy, assignors to Sisas Societa Italiana Serie Acetica E Sintetica SPA, Milan, Italy

Filed Sep. 24, 1990, Ser. No. 587,080
Claims priority, application Italy, May 31, 1990, 20504 A/90
Int. Cl.[5] B01D *47/00*
U.S. Cl. 55—44 **9 Claims**

1. A process for the recovery of maleic anhydride from a gaseous mixture thereof, said process comprising the steps of:

(a) contacting the aqueous mixture containing maleic anhydride with an liquid absorbant for the maleic anhydride to give an enriched liquid absorbant;

(b) contacting the enriched liquid absorbant from (a) with a water adsorbant to reduce the water content of said enriched liquid absorbant to produce a dried enriched liquid absorbant; and then

(c) recovering the maleic anhydride from the dried enriched liquid absorbant from (b).

5,069,688
PRESSURE SWING GAS SEPARATION

Alan A. Wells, Ely, England, assignor to The Haser Company Limited, England

Continuation-in-part of Ser. No. 398,306, Aug. 22, 1989, Pat. No. 4,948,360, which is a continuation of Ser. No. 117,783, Nov. 6, 1987, abandoned. This application Nov. 13, 1989, Ser. No. 435,121
Claims priority, application United Kingdom, Nov. 6, 1986, 8626562; Nov. 10, 1988, 8826378
Int. Cl.[5] B01D *53/04*
U.S. Cl. 55—25 **37 Claims**

1. A method of operating a pressure swing gas separator which is cycled between pressurized and depressurized states, wherein a pressure difference of less than 0.1 bar exists between said pressurized and depressurized states.

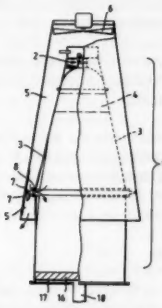
7. A pressure swing gas separator comprising:

(a) a resonant system having a natural resonant frequency;

(b) a bed of adsorbent material, said bed of adsorbent material being located in and forming part of said resonant system; and,

(c) means operating at said natural resonant frequency of

said resonant system alternately to pressurize and depressurize said bed of adsorbent material whereby pressure



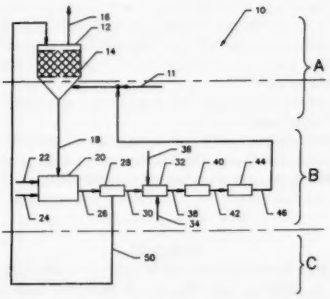
energy of a gas mixture desorbed from said adsorbent bed is substantially recovered.

5,069,689

CLOSED LOOP POLLUTION CONTROL SYSTEM

Abraham Goldhaar, Los Angeles, Calif., assignor to Westates Carbon, Los Angeles, Calif.

Filed Feb. 7, 1991, Ser. No. 652,116
Int. Cl.[5] B01D *53/08*
U.S. Cl. 55—61 **30 Claims**



1. A closed loop process for cleaning contaminated main gas stream with activated sorbent, reactivating spent sorbent, and combusting the contaminant comprising:

(a) beginning a phase by introducing a main gas stream containing a contaminant into a sorption zone and sorbing the contaminant on activated sorbent contained therein thereby producing a cleaned main gas stream;

(b) after the activated sorbent in the sorption zone sorbs a predetermined amount of the contaminant thereby forming a spent sorbent, stopping the introduction of the contaminated main gas stream into the sorption zone;

(c) beginning the next phase by conveying the spent sorbent which contains the contaminant sorbed thereon from the sorption zone to a reactivation zone;

(d) recharging activated sorbent to the sorption zone and resuming introducing the main gas stream containing the contaminant to the sorption zone;

(e) heating the spent sorbent in the reactivation zone to a first predetermined elevated temperature and removing the contaminant from the spent sorbent with a second gas stream thereby producing an reactivated sorbent and a contaminant laden gas stream;

(f) separating the contaminant laden gas stream from the reactivated sorbent;

(g) heating the separated contaminant laden gas stream in the presence of oxygen in a combustion zone to a second predetermined temperature operable for combusting the contaminant thereby forming a combustion gas, the amount of oxygen being sufficient to oxidize the contaminant in the contaminant laden gas stream, the combined flow of the second gas stream and the oxygen being no greater than about 50% of the flow of the main gas stream, the second predetermined temperature being higher than the first predetermined elevated temperature;

(h) cooling the combustion gas to a third predetermined temperature; thereafter

(i) adjusting the relative humidity of the combustion gas so that it has a relative humidity less than 50%; thereafter

(j) contacting the combustion gas with the activated sorbent in the sorption zone to remove undesirable components in the combustion gas thereby forming a cleaned combustion gas suitable for venting;

(k) venting the cleaned combustion gas and the cleaned main gas stream from the sorption zone; and

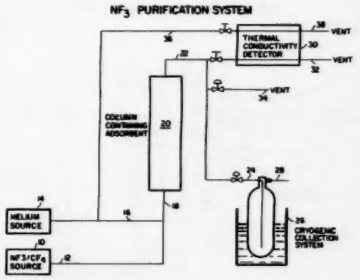
(l) after the activated sorbent in the sorption zone sorbs the predetermined amount of the contaminant thereby forming additional spent sorbent, stopping the introduction of the contaminated main gas stream into the sorption zone, then in the next phase repeating steps (c) through (k) and using the separated reactivated sorbent as the activated sorbent mentioned in step (d).

5,069,690

PROCESS FOR KINETIC GAS-SOLID CHROMATOGRAPHIC SEPARATIONS

Philip B. Henderson, Wescosville; Charles G. Coe, Macungie; Donald E. Fowler, Allentown, and Montford S. Benson, Wescosville, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 21, 1991, Ser. No. 660,474
Int. Cl.[5] B01D *15/08, 53/04*
U.S. Cl. 55—67 **18 Claims**



1. A method of recovering a purified first component from a mixture of at least first component and second component using gas-solid chromatography comprising passing discrete pulses of a mixture of the first and second component in a continuous flow of an inert carrier gas through a bed of porous adsorbent that kinetically adsorbs one component more readily than the other component and having an effective pore window sufficient for kinetic differentiation of the components at an appropriate mass velocity for a kinetic separation and separately recovering the first component from the bed as product first component having a reduced content of the second component.

5,069,691

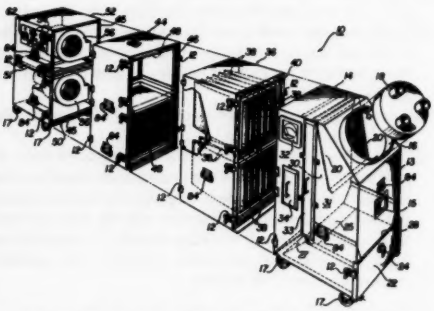
PORTABLE FILTRATION UNIT

Terrell Travis, Alpharetta; David Shagott, Duluth, both of Ga.; Gary Kruse, Lincoln University, Pa.; Daniel Sutherland, and Blair Harber, Jr., both of Ontario, Canada, assignors to Abatement Technologies, Duluth, Ga.

Filed Nov. 14, 1990, Ser. No. 613,212

Int. Cl.[5] B01D *50/00*

U.S. Cl. 55—126 **2 Claims**



1. A portable vacuum and air filtration unit, comprising:

a) a plurality of separately transportable modules and a means for locking the modules together during use;

b) an air inlet located in one of the modules;

c) a debris deflector and a means for receiving debris stopped by the deflector located in one of the modules;

d) an electrostatic filter located in one of the modules;

e) a bag filter assembly located in one of the modules;

f) a HEPA filter assembly located in one of the modules; and

g) a means for drawing a substantial volume of air through the inlet, deflector, electrostatic filter, bag filter assembly and HEPA filter assembly.

5,069,692

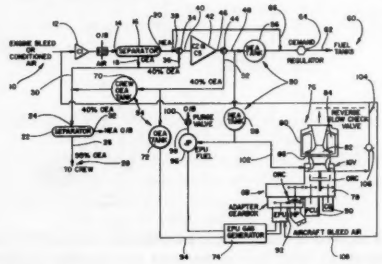
FULLY INTEGRATED INERT GAS AND OXIDIZER REPLENISHMENT SYSTEM

Robert Grennan; John Rice, and Steven Squier, all of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 11, 1989, Ser. No. 448,258

Int. Cl.[5] B01D *53/04, 53/22*

U.S. Cl. 55—158 **4 Claims**



1. A fully integrated system for on board disposition on an aircraft for providing on board generation of inert gas, on board generation of oxygen, and on board generation of oxidant and inert gas for functions of auxiliary and/or emergency power units and comprising:

a system inlet adapted to receive engine bleed air or conditioned environmental control system air available on an aircraft;

a first separator connected to said inlet to receive said bleed or conditioned air therefrom and having a nitrogen enriched air (NEA) outlet and an oxygen enriched air (OEA) outlet;

a second separator having an inlet connected to said OEA outlet and a first outlet adapted to be connected to aircraft crew oxygen consuming means, and a second, waste outlet, said second separator further enriching OEA received from said first separator and directing the same to said first outlet while providing a nitrogen enriched waste stream to said second outlet;

a compressor;

a first three way valve means having inlets connected to both said NEA outlet and said OEA outlet and an outlet connected to said compressor and being selectively operable to direct either NEA or OEA from said first separator to said compressor to be compressed thereby;

NEA storage means;

OEA storage means;

second three way valve means having an inlet connected to said compressor to receive compressed gas therefrom and outlets respectively connectable to said NEA storage means and to said OEA storage means, and selectively operable to direct compressed NEA or OEA to the corresponding storage means;

a conduit adapted to be connected to aircraft fuel tanks and connected to said NEA storage means to receive NEA therefrom to provide an inert atmosphere within the aircraft fuel tanks;

an NEA bypass connecting said NEA outlet to said conduit so that NEA received directly from said separator may be flowed to aircraft fuel tanks;

gas turbine engine means for providing for auxiliary power and emergency power aboard an aircraft and including at least one turbine wheel and power generating equipment;

an auxiliary combustor for said gas turbine engine means and adapted to receive OEA and fuel and combust the same to provide gases of combustion to rapidly accelerate said turbine wheel;

a fuel system including a fuel line connected to said auxiliary combustor; and

means connecting said OEA storage means to said auxiliary combustor so that stored OEA may be directed thereto under emergency condition to rapidly start said gas turbine engine means.

5,069,693

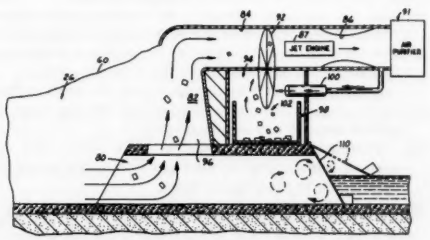
SYSTEM FOR AREA POLLUTION CONTROL

Wendell A. Blikken, and Wayne C. Blikken, both of 952 S. Grove Rd., Ypsilanti, Mich. 48198

Filed Oct. 23, 1990, Ser. No. 601,450

Int. Cl.[5] B01D *46/00, 47/02*

U.S. Cl. 55—220 **4 Claims**



1. A system for collecting and purifying polluted air in an urban geographic area subject to smog conditions and high volume automotive traffic at spaced intervals in a 24-hour day,

(a) utilizing a plurality of open water draining which channels in an urban collection area, which channels are arranged in a flow pattern to carry rainfall water to a discharge area,

(b) installing covers over said open channels to enclose said open channels to provide an elongate air passage in said channels,

(c) providing side passages in said covers to admit drainage water into said channels and to meter polluted air into said channels in response to an induced sub-atmospheric pressure in said channels,

(d) providing a high volume of a jet engine of airplane capacity to create sub-atmospheric pressure in said channels and carry air in said channels to a converging area of said channels, and

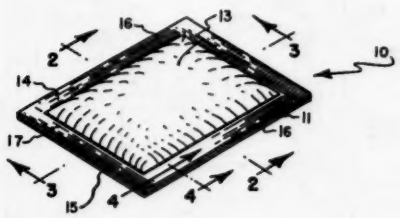
(e) providing a depollution apparatus for said air prior to discharge at a site remote from the collection area in which said channels are located.

5,069,694

PACKET FOR COMPOUND TREATMENT OF GASES

John S. Cullen, Buffalo, and Samuel A. Incorvia, Tonawanda, both of N.Y., assignors to Multiform Desiccants, Inc., Buffalo, N.Y.

Filed Jul. 2, 1990, Ser. No. 546,837
Int. Cl.[5] B01D *59/14*
U.S. Cl. 55—318 **7 Claims**



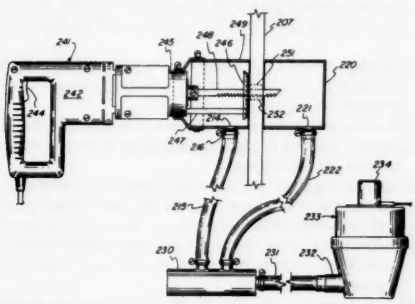
1. A packet for effecting a compound treatment of gaseous material comprising a permeable envelope of sheet material, the sheet material having powdered carbon dispersed therein for effecting a first treatment of said gaseous material, and bulk material means in said envelope for effecting a second treatment of said gaseous material.

5,069,695

TENT-FREE APPARATUS FOR PARTICULATE CONTAMINATION CONTROL

Garey Austin, Muscle Shoals, Ala., assignor to Tennessee Valley Authority, Muscle Shoals, Ala.

Division of Ser. No. 546,266, Jun. 26, 1990, Pat. No. 5,034,041. This application Apr. 15, 1991, Ser. No. 685,249
Int. Cl.[5] B01D *50/00*
U.S. Cl. 55—385.1 **9 Claims**



1. An improved, tent-free particulate contamination control system for effecting protection of human operators against the deleterious health hazards normally caused by the effects of certain airborne fine particulate contamination, including asbestos fibers, said human operators having occasion to work in an are that is environmentally in communication with a source, including cutting means, for generating a high level of such particulate contamination, said system comprising:

cutting means for effecting cutting of at least one plate member; said plate member generally having a determinable target side and a side opposite to said target side and comprising materials that are characterized by a readily determinable content of material that has been determined to be carcinogenic when inhaled by humans and further characterized as being friable; said cutting means including saw blade means, saw blade drive means, base member means having a bottom portion thereof, and saw housing means for generally enclosing at least a portion of said saw blade drive means;

first cowling means comprising an elongated, hollow member adapted at one end thereof for sealing engagement with said saw housing means and an aperture at the other end thereof, said aperture defining a plane substantially parallel to and juxtaposed the target side of said plate member;

second cowling means comprising an elongated, hollow member being generally closed at one end thereof and an aperture at the other end thereof, said aperture defining a plane substantially parallel to and juxtaposed the side of said plate member opposite to said target side; and

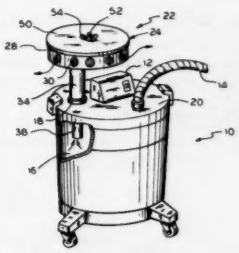
at least one filtration unit operatively associated with both said first and second cowling means and flow connected therewith by means of non-collapsible vacuum hoses; said at least one filtration unit operatively associated with blower means adapted to pull air into said cowling means and thence into the at least one filtration unit wherefrom the resulting filtered air is exhausted to the atmosphere.

5,069,696

SHOP VAC HAVING EXTERNAL EXHAUST FILTER

Anthony R. Bruno, III, 129 Valley Rd., Sewickley, Pa. 15143

Filed Nov. 28, 1990, Ser. No. 618,889
Int. Cl.[5] B01D *46/02*
U.S. Cl. 55—476 **4 Claims**



1. A shop type vacuum cleaner including an externally mounted filter comprising in combination:

a shop type vacuum cleaner of the type having an exhaust outlet from an internal compartment in which debris is collected;

an exhaust filter mounted to the vacuum cleaner at said exhaust outlet, said exhaust filter including a filter housing having an inlet communicating with a filter element in the housing and an elongated inlet tube having an inlet passage communicating with the inlet and;

adapter means for adapting said inlet tube for receipt in different size exhaust outlets of the vacuum cleaner.

5,069,697
POROUS CERAMIC HONEYCOMB FILTER AND METHOD OF PRODUCING THE SAME

Kunikazu Hamaguchi; Takashi Harada, both of Nagoya, and Toshiyuki Hamanaka, Suzuka, all of Japan, assignors to NGK Insulators, Ltd., Aichi, Japan

Filed Aug. 3, 1989, Ser. No. 389,336
Claims priority, application Japan, Aug. 12, 1988, 63-201657
Int. Cl.[5] B01D *39/20;* **C04B** *35/64*
U.S. Cl. 55—523 **4 Claims**

1. A method of producing a porous ceramic honeycomb filter, comprising the steps of:

mixing a cordierite raw material consisting essentially of 42–56 wt% SiO_2, 30–45 wt% Al_2O_3, and 12–16 wt% MgO as main components, with a pore forming agent;

adjusting a grain size of fine particles of the raw material such that a total amount of particles having a grain size not larger than 2 μm is not more than 35% of the entire wt% of the mixture;

adding a plasticizer and a binder to the adjusted raw material to make a batch mixture;

extrusion molding the batch mixture to produce a ceramic honeycomb filter;

drying the extruded ceramic honeycomb filter; and

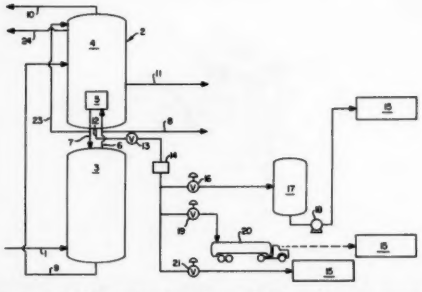
firing the extruded ceramic honeycomb filter at a firing temperature in a range of 1350°–1440° C.

3. A porous ceramic honeycomb filter produced by the method of claim 1, the ceramic honeycomb filter having a chemical composition consisting essentially of 42–56 wt% SiO_2, 30–45 wt% Al_2O_3, and 12–16 wt% MgO as main components, and cordierite as a main component of a crystalline phase, wherein the ceramic honeycomb filter has a porosity of at least 40% but not greater than 55%, and a volume of pores in the ceramic honeycomb filter having a diameter not larger than 2 μm is not greater than 0.015 cc/g.

5,069,698
XENON PRODUCTION SYSTEM

Harry Cheung; Michael R. Couche, both of Williamsville, and James R. Dray, Kenmore, all of N.Y., assignors to Union Carbide Industrial Gases Technology Corporation, Danbury, Conn.

Filed Nov. 6, 1990, Ser. No. 609,624
Int. Cl.[5] F25J *3/04*
U.S. Cl. 62—22 **19 Claims**



1. A method for enhancing the production of xenon comprising:

(A) separating a mixture containing krypton, xenon and oxygen in a first cryogenic rectification system and producing gaseous oxygen product and liquid containing krypton and xenon in equilibrium with the gaseous oxygen product;

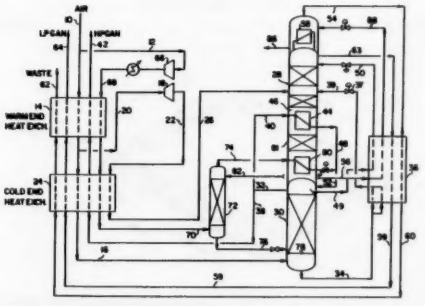
(B) removing gaseous oxygen product from the first cryogenic rectification system and removing liquid containing krypton and xenon from the first cryogenic rectification system at a molar flowrate no more than 5 percent of the molar flowrate at which the gaseous oxygen product is removed and having a ratio of krypton to xenon in the liquid removed from said first cryogenic rectification system less than that of said mixture containing krypton, xenon and oxygen; and

(C) providing liquid removed from the first cryogenic rectification system in step (B) into a second cryogenic rectification system which can produce a fluid containing krypton and xenon in a concentration greater than their concentration in air.

5,069,699
TRIPLE DISTILLATION COLUMN NITROGEN GENERATOR WITH PLURAL REBOILER/CONDENSERS

Rakesh Agrawal, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 20, 1990, Ser. No. 585,831
Int. Cl.[5] F25J *3/02*
U.S. Cl. 62—24 **10 Claims**



1. A cryogenic process for the production of nitrogen by distilling air in a triple column distillation system consisting essentially of an associated discrete extra pressure column, a high pressure column and a low pressure column, comprising:

a) dividing a compressed feed air stream into a first and second air substreams;

b) cooling the first air substream to near its dew point and rectifying the cooled, first substream in the high pressure column, thereby producing a high pressure nitrogen overhead stream and a crude oxygen bottoms liquid;

c) further compressing and cooling the second air substream to near its dewpoint and feeding the further compressed, cooled, second substream to the bottom section of the extra high pressure distillation column, thereby producing an extra high pressure (EHP) overhead nitrogen stream and an oxygen-rich bottoms liquid stream;

d) condensing the EHP overhead nitrogen stream in a lowermost reboiler/condenser located in the lower portion of the stripping section of the low pressure distillation column;

e) feeding at least a portion of the condensed EHP nitrogen stream to the top section of the extra high pressure column as liquid reflux;

f) feeding the oxygen-rich bottom stream from the high pressure column to the middle section of the low pressure column for distillation;

g) condensing a portion of the high pressure overhead nitrogen stream in an upper reboiler/condenser located in the middle portion of the stripping section of the low pressure column, and returning said condensed portion to the top of the high pressure column to provide liquid reflux to the high pressure column;

h) removing the balance of the high pressure overhead nitrogen stream from the top of the high pressure column, warming this high pressure stream to recover refrigeration and recovering the warmed high pressure stream

from the process as a high pressure first nitrogen product, and

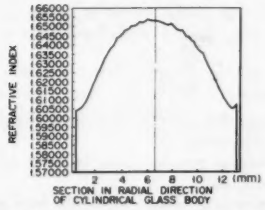
i) removing a low pressure nitrogen stream from the top of the low pressure column, warming the removed nitrogen stream to recover refrigeration and recovering the warm, low pressure stream from the process as a low pressure second nitrogen product.

5,069,700

METHOD OF MANUFACTURING GRADIENT-INDEX GLASS

Masayuki Yamane, Yokohama, and Atsuo Yasumori, Mitaka, both of Japan, assignors to President of Tokyo Institute of Technology, Tokyo, Japan

Filed Mar. 11, 1991, Ser. No. 667,582
Claims priority, application Japan, Apr. 12, 1990, 2-95055
Int. Cl.[5] C03C *1/00*; C03B *19/06*
U.S. Cl. 65—17 **7 Claims**



1. A method of manufacturing a gradient-index glass, comprising the steps of:

(a) hydrolyzing a solution consisting of an alkoxide of silicon and an alkoxide of boron to prepare a sol; (b) adding an aqueous solution of lead acetate and an organic acid to said sol to prepare a gel porous body;

(c) aging and sequentially treating said gel porous body by sequentially using a water-isopropanol solution of lead acetate, an isopropanol-acetone solution, and acentone, thereby performing a pretreatment;

(d) dipping said pretreated gel porous body into a lower alcohol solution of at least one of potassium acetate and sodium acetate to form a lead ion concentration distribution which is gradually changed from a surface to an interior of said gel porous body;

(e) sequentially treating said gel porous body having the lead ion concentration distribution by sequentially using an isopropanol-acetone solution and acentone; and

(f) drying and heating said gel porous body to prepare a glass body.

5,069,701

PREPARATION OF FLUORIDE GLASS BY CHEMICAL VAPOR DEPOSITION

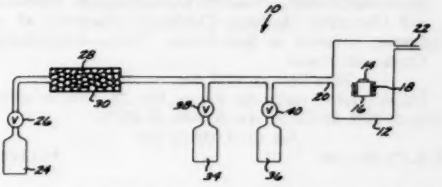
Ricardo C. Pastor, Manhattan Beach, and Luisa E. Gorre, Oxnard, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Continuation of Ser. No. 107,740, Jul. 13, 1987, abandoned. This application Feb. 23, 1990, Ser. No. 488,374
Int. Cl.[5] C03B *37/016*
U.S. Cl. 65—18.2 **13 Claims**

1. A process for preparing a fluoride glass having at least one metallic cation, comprising the steps of:

furnishing a heated substrate;

contacting to the substrate a mixture of a metallo-organic compound in which a metallic cation is bonded to a carbon atom through an electronegative atom selected from the group consisting of oxygen, nitrogen, and sulfur, sufficient amount of an oxidizing species reactive with carbon to convert substantially all carbon in the mixture to carbon monoxide, and carbonyl fluoride produced by a reaction of a reaction mixture selected from the group consisting of a mixture of carbon dioxide and carbon tetrafluoride and a mixture of carbon dioxide and decomposed poly(tetrafluorethylene), whereupon through the action of the carbonyl fluoride the metallo-organic compound is



decomposed to yield a solid containing a metal fluoride deposited on the substrate; and

consolidating said solid to a fully glassy material.

5,069,702

METHOD OF MAKING SMALL HOLLOW GLASS SPHERES

Jacob Block, Rockville, Md.; Noel J. Tessier, North Attleboro, and Anthony J. Colageo, Sharon, both of Mass., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Dec. 20, 1990, Ser. No. 632,199
Int. Cl.[5] C03B *19/10*
U.S. Cl. 65—21.4 **20 Claims**

1. A process for the preparation of hollow glass spheres comprising the steps of:

a) combining

i) a surfactant,

ii) at least one source of components necessary to form said glass,

iii) a compound capable of producing a gas when heated, and

iv) water, to form an aqueous solution or dispersion;

b) forming droplets from the surfactant-containing solution or dispersion;

c) heating the droplets to form hollow glass spheres; and

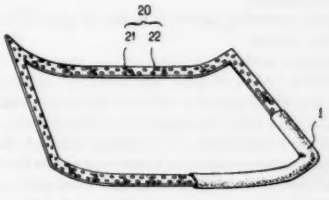
d) cooling and recovering the hollow glass spheres.

5,069,703

COVERING FOR THE TEMPERING OF GLASS

Benoit d'Iribarne; Hans-Werner Kuster, both of Aachen, Fed. Rep. of Germany, and Luc Vanaschen, Eupen, Belgium, assignors to Saint-Gobain Vitrage, Courbevoie, France

Continuation of Ser. No. 257,875, Oct. 14, 1988, Pat. No. 4,906,271. This application Oct. 2, 1989, Ser. No. 415,774
Claims priority, application France, Oct. 14, 1987, 87 14185
Int. Cl.[5] C03B *21/00*
U.S. Cl. 65—104 **11 Claims**



1. Covering to be inserted between glass plates at their bending and tempering temperature and supports therefor, comprising an essentially metal fabric having a thermal conductivity less than 3 $W.M^{-1}.K^{-1}$.

5,069,704

METHOD AND APPARATUS FOR SHAPING CURVED GLASS SHEETS

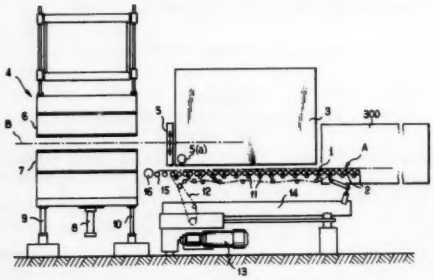
Philippe Boutier, Waterloo; Jean-Marc Petit-Collin, Thourotte; Dany-Ange Plebani, Thourotte; Denis Mathivat, Thourotte, and Christophe Machura, Chevincourt/Thourotte, all of France, assignors to Saint-Gobain Vitrage International, Courbevoie, France

Filed Dec. 21, 1989, Ser. No. 454,649

Claims priority, application France, Dec. 21, 1988, 88 16894; Mar. 9, 1989, 89 03078; Mar. 9, 1989, 89 03076

Int. Cl.[5] C03B *23/023*

U.S. Cl. 65—106 11 Claims



1. A method of curving a sheet of glass comprising the steps of:

preheating the glass sheet to a temperature above the softening point of the glass;

conveying said glass sheet by way of a conveyor, in a horizontal position, to a shaping cell including a curving mold mounted in a suction chest;

transferring said glass sheet, within said shaping cell, above said conveyor by applying a suction force until the glass sheet comes into contact with the curving mold mounted in the suction chest and curving the glass sheet while in contact with the curving mold, wherein said suction chest comprises two elements, at least one of said two elements being movable relative to the other, one of said two elements being an upper element for carrying the curving mold so that a carriage for receiving the glass sheet can enter between the two elements when the curving mold is in a raised position.

7. A production line for producing curved glass sheets comprising;

a furnace for heating the glass sheets;

a curving station;

means for removing defective bodies of glass; and

a cooling station;

said furnace, said curving station, said means for removing defective bodies of glass, and said cooling station being successively disposed in the same alignment, and the level of the glass sheets in the cooling station being different from the sheets during their passage through the furnace and the curving station, wherein said means for removing defective bodies of glass comprises atomization means for discharging jets of atomized fluid, said defective bodies being cracked by said atomized fluid, said means for removing defective bodies of glass further comprising crushing means for crushing said glass after said glass is cracked.

5,069,705

APPARATUS FOR CAMBERING GLASS SHEETS BY ELASTICALLY BENDING A SHAPING ROLLER

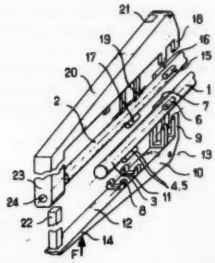
Bernard Letemps, Thourotte, and Jacques Leclercq, Roisel, both of France, assignors to Saint-Gobain Vitrage International, Courbevoie, France

Filed Jul. 19, 1990, Ser. No. 554,386

Claims priority, application France, Aug. 14, 1989, 89 10871

Int. Cl.[5] C03B *23/33*

U.S. Cl. 65—289 14 Claims



1. A shaping roller assembly in a cambering installation for glass plates, comprising:

a first cylindrical bending rotatable about the longitudinal axis thereof; and

means for elastically bending said roller between two secant planes perpendicular to said axis, said planes intersecting said roller adjacent the ends thereof;

means for vertically displacing a distal end of said first support arm; and

a second cylindrical roller positioned vertically over said first roller and a second support arm,

wherein the ends of the elastically bent roller remain straight, and wherein said second support arm cooperates with said first support arm such that said means for displacing said first support arm simultaneously displaces said second support arm.

5,069,706

METHOD AND COMPOUND FOR CLEARING FLORA FROM SEWER LINES USING ORGANIC HERBICIDES

Timothy W. Tobiason, Silver Creek, Nebr., assignor to Toby's Chemical Company, Silver Creek, Nebr.

Continuation-in-part of Ser. No. 436,071, Nov. 13, 1989. This application Nov. 13, 1990, Ser. No. 614,833

The portion of the term of this patent subsequent to Nov. 5, 2008, has been disclaimed.

Int. Cl.[5] A01N *25/30, 33/00, 33/06, 31/00*

U.S. Cl. 71—65 10 Claims

1. A flora growth inhibitor product adapted for inhibiting the growth of flora in a sewer line, comprising:

an organic herbicide;

a dry acid;

a carbonate; and

a surfactant mixed with said alkali carbonate and said acid whereby foam is produced in water for vertically elevating said organic herbicide such that flora roots growing within a sewer line are coated with said herbicide thereby inhibiting growth of flora in a sewer line.

5,069,707

METHOD FOR REGULATING THE FLOWERING OF PLANTS AND FLOWERING REGULATORS OF PLANTS

Go Takeba, Otsu, and Osamu Tanaka, Jyoyo, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Mar. 13, 1990, Ser. No. 492,914
Claims priority, application Japan, Mar. 13, 1989, 1-060064
Int. Cl.[5] A01N *57/00, 43/48*
U.S. Cl. 71—86 6 Claims

1. A method for regulating the flowering of a plant, comprising treating a plant with a flowering regulating effective amount of a protease inhibitor selected from the group consisting of elastatinal, bestatin, diisopropylfluorophosphoric acid, CTAH and epibestatin.

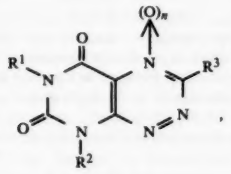
5,069,708

PYRIMIDO(5,4-E)-AS-TRIAZINE-5,7(6H,8H)-DIONES

Norbert Meyer, Ladenburg; Ulrich Shirmer, Heidelberg; Peter Plath, Frankenthal; Bruno Wuerzer, Otterstadt, and Karl-Otto Westphalen, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 3, 1990, Ser. No. 547,160
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1989, 3923226; Jul. 27, 1989, 3924845
Int. Cl.[5] C07D *487/04;* A01N *43/90*
U.S. Cl. 71—90 4 Claims

1. A process for combating the growth of unwanted plants, wherein a herbicidally effective amount of a compound of the formula Ia



(Ia)

where

R^1 and R^2 are each hydrogen, C_1–C_6-alkyl, C_3–C_6-cycloalkyl, C_2–C_8-alkenyl,phenyl or benzyl;

R^3 is hydrogen, halogen, nitro, C_1–C_8-alkyl which may carry up to three of the following substituents:

halogen, hydroxyl, C_1–C_6-alkoxy, C_1–C_6-alkyl, C_1–C_4-alkoxy-C_1–C_4-alkoxy, C_2–C_6-alkenyl, C_1–C_6-alkylthio, phenyl or benzyl;

C_2–C_6-alkenyl or phenylalkenyl;

C_3–C_6-cycloalkyl which may carry up to three C_1–C_4-alkyl groups as substituents;

4-tetrahydropyranyl or 3-tetrahydrothiopyranyl; —CO—R^4 or —CO—O—R^4;

where R^4 is hydrogen or C_1–C_6-alkyl;

4-chlorophenyl, phenyl,

4-nitrophenyl, 4-(dimethylamino)-phenyl, 2-pyridyl, 3-pyridyl, 3-pyridyl.HCl, 4-pyridyl, 2-thienyl, 3-thienyl, 1-ethylpyrazol-4-yl, 3-methylisoxazol-5-yl, 2-(prop-3-yl)-isoxazol-5-yl, 3-propylisoxazol 5-yl or 3-butylisoxazol-5-yl; phenyl substituted by one to three of the following substituents: halogen, nitro, C_1–C_6-alkyl, C_2–C_6-alkenyl, C_1–C_6-alkoxy or an amino group -NR^4R^5, where R^5 is one of the radicals R^4; ZR^6, where Z is oxygen, sulfur or a group —(NR^7)— and R^6 is hydrogen, C_1–C_6-alkyl or a phenyl or benzyl group which may carry up to three of the following substituents on the nucleus: C_1–C_6-alkyl, C_1–C_6-alkoxy or halogen,

and where R^7 is hydrogen or C_1–C_6-alkyl, pyrrolidino and N-morpholino; and

n is 0 or 1, or a salt of Ia with a mineral acid is allowed to act on plants, their habitat or on seed.

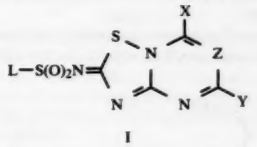
5,069,709

HERBICIDAL THIADIAZOLO PYRIMIDINES

Russell F. Bellina, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 8, 1990, Ser. No. 492,575
Int. Cl.[5] A01N *43/90;* C07D *513/04*
U.S. Cl. 71—90 15 Claims

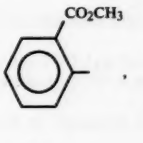
1. Compounds of Formula I,



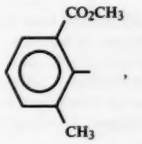
I

wherein

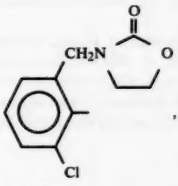
L is



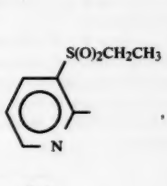
L-1



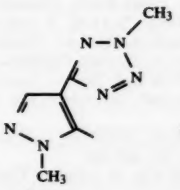
L-2



L-3

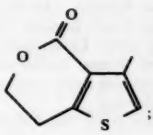


L-4



L-6

or



L-7

X and Y are independently C_1-C_2 alkyl, C_1-C_2 alkoxy, C_1-C_2 haloalkoxy, $NHCH_3$ or $N(CH_3)_2$; and

Z is CH; and their agriculturally suitable salts provided that

1) when X and/or Y is C_1 haloalkoxy, then Z is CH; and

2) when L is L-1 or L-2, then at least one of X and Y is $NHCH_3$ or $N(CH_3)_2$.

11. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

5,069,710
N-((6-TRIFLUOROMETHYLPYRIMIDIN-2-YL)-AMINOCARBONYL)-2-CARBOALKOXYBENZENESULFONAMIDES

Karl-Otto Westphalen, Speyer; Gerhard Hamprecht, Weinheim; Bruno Wuerzer, Otterstadt, and Norbert Meyer, Ladenburg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

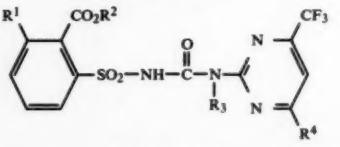
Filed Apr. 14, 1989, Ser. No. 337,866

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1988, 3813623

Int. Cl.[5] C07D *239/69, 239/42;* **A01N** *43/54*

U.S. Cl. 71—92 **4 Claims**

1. An N-((6-trifluoromethylpyrimidin-2-yl)-aminocarbonyl)-2-carboalkoxybenzenesulfonamide of the formula Ia



Ia

where the substituents have the following meanings:

R^1 is hydrogen or halogen,

R^2 is hydrogen, C_1–C_5-alkyl, C_3–C_4-alkenyl, C_3–C_4-alkynyl, C_1–C_5-haloalkyl, C_3–C_5-alkoxyalkyl, C_3–C_5-haloalkoxyalkyl or C_5–C_6-cycloalkyl,

R^3 is hydrogen, C_1–C_2-alkyl, allyl, propargyl or C_1–C_5-alkoxy,

R^4 is halogen, C_1–C_2-alkyl, C_1–C_3-alkylthio or C_1–C_3-alkylamino, with the proviso that

R^3 is not hydrogen or C_1–C_2-alkyl or C_1–C_5-alkoxy when R^4 is halogen or C_1–C_2-alkyl, and their environmentally tolerated salts.

4. A process for combating unwanted plants, wherein a herbicidally effective amount of an N-((6-trifluoromethylpyrimidin-2-yl)aminocarbonyl)-2-carboalkoxybenzenesulfonamide of the formula Ia as set forth in claim **1**, or an agriculturally useful salt thereof, is allowed to act on the plants and/or their habitat.

5,069,711
HERBICIDAL N-ARYL-SUBSTITUTED NITROGEN-CONTAINING HETEROCYCLES

Reiner Fischer, Monheim; Uta Jensen-Korte, Duesseldorf; Franz Kunisch, Odenthal; Albrecht Marhold, Leverkusen; Pieter Ooms, Krefeld; Otto Schallner, Monheim; Hans-Joachim Santel, Leverkusen; Robert R. Schmidt, Gladbach, and Harry Strang, Duesseldorf, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

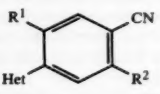
Division of Ser. No. 419,809, Oct. 11, 1989. This application Feb. 1, 1991, Ser. No. 649,101

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1988, 3835168

Int. Cl.[5] A01N *43/48, 43/36;* **C07D** *471/02, 211/22*

U.S. Cl. 71—92 **14 Claims**

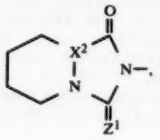
1. An N-aryl-substituted nitrogen-containing heterocycle of the formula



(I)

in which

Het represents a heterocycle of the formula



R^1 represents hydrogen or halogen and

R^2 represents halogen, hydroxyl or represents a radical $-Z^2-R^8$,

where

X^2 represents a CH group

Z^1 represents oxygen or sulphur,

Z^2 represents oxygen or sulphur,

R^8 represents in each case optionally substituted alkyl, alkenyl, alkinyl or cycloalkyl.

5,069,712
IMIDAZOLIDINE DERIVATIVES

Wilfried Draber; Peter Babczinsky, both of Wuppertal; Hans-Joachim Santel, Leverkusen; Klaus Lürssen, and Robert R. Schmidt, both of Bergisch Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 4, 1991, Ser. No. 680,212

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1990, 4011870

Int. Cl.[5] A01N *43/50*

U.S. Cl. 71—92 **11 Claims**

1. An imidazolidine derivative of the formula (I) in which

R represents straight-chain or branched alkyl having 1 to 6 carbon atoms which is optionally substituted by halogen, or represents cycloalkyl having 3 to 8 carbon atoms which is optionally substituted by straight-chain or branched alkyl having 1 to 4 carbon atoms, or represents phenyl which is optionally substituted by cyano, nitro or halogen, or represents alkyl, alkoxy or alkylthio, each of which has 1 to 4 carbon atoms and each of which is optionally substituted by halogen, and

X and Y independently of one another represents hydrogen, halogen, cyano, nitro or carboxyl, or represents alkly, alkoxy, alkoxycarbonyl, alkylthio, alkylsulphinyl or alkylsulphonyl, each of which has up to 4 carbon atoms and each of which is optionally substituted by halogen.

10. A method for combating unwanted vegetation, which comprises applying to such vegetation or to a locus from which it is desired to exclude such vegetation a herbicidally effective amount of an imidazolidine derivative according to claim **1**.

5,069,713
PERMANENT MAGNETS AND METHOD OF MAKING

Ivor R. Harris, and Syed H. Safi, both of Birmingham, Great Britain, assignors to The University of Birmingham, Edgbaston, England

Filed Apr. 4, 1988, Ser. No. 177,388

Claims priority, application United Kingdom, Apr. 2, 1987, 8707905

Int. Cl.[5] C22C *29/12*

U.S. Cl. 75—232 **11 Claims**

1. A permanent magnet, comprising a coherent non-sintered body comprised of a particulate, stoichiometric alloy, wherein said alloy had uniaxial magnetocrystalline anisotropy and the surfaces of the particles have a continuous coating thereon of a material selected from the group consisting of a reaction product of the alloy and a non-magnetic metal, wherein said reaction product is selected from the group consisting of oxides, chlorides, nitrides, carbides, borides, silicides, fluorides, phosphides and sulphides of the alloy, and said non-magnetic

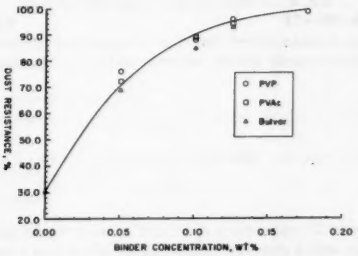
metal is selected from the group consisting of tin, gallium, zinc, aluminum and copper.

5,069,714

SEGREGATION-FREE METALLURGICAL POWDER BLENDS USING POLYVINYL PYRROLIDONE BINDER

Francis Gosselin, Sorel, Canada, assignor to Quebec Metal Powders Limited, Tracy, Canada

Filed Jan. 17, 1990, Ser. No. 466,664
Int. Cl.[5] B22F *1/00*
U.S. Cl. 75—252 **34 Claims**



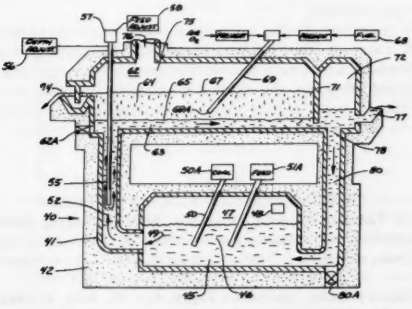
1. A metallurgical powder composition capable of forming by a P/M process a compact in a dye cavity, said powder composition being uniformly blended and comprising ferrous powder having a maximum particle size of at most about 300 microns; and at least one powder of (i) an alloying agent in the amount of less than about 15 weight percent, (ii) a lubricant in the amount of less than about 5 weight percent or (iii) an additive in the amount of less than about 5 weight percent, said composition further comprising a binding agent for preventing the alloying powder, lubricant or additive from segregating from said composition, said binding agent comprising polyvinyl pyrrolidone.

5,069,715

DIRECT SMELTING PROCESS AND APPARATUS

Kenneth J. Reid, Edina, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Apr. 2, 1990, Ser. No. 503,280
Int. Cl.[5] C21B *11/08*
U.S. Cl. 75—414 **22 Claims**



1. A process for smelting iron ores to form carburized metal comprising the steps of providing a quantity of molten metal substantially free of slag;

smelting iron ore by injecting the iron ore into the molten metal in a first chamber;

selectively carburizing the molten metal in said first chamber by adding carbonaceous solids;

circulating molten metal by pumping the metal from the first chamber to a second chamber;

heating the metal in the second chamber connected to the first chamber by combustion while preventing contact of combustion gases with the molten metal; and

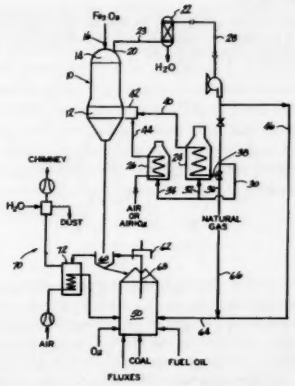
recirculating a substantial portion of the molten metal to the first chamber through a second conduit, the molten metal circulation being solely through the energy impetus added by the pumping during circulating the molten metal from the first chamber to the second chamber.

5,069,716

PROCESS FOR THE PRODUCTION OF LIQUID STEEL FROM IRON CONTAINING METAL OXIDES

Oscar G. Dam G.; Henry R. Bueno C.; Gerardo A. Contreras L.; Yura Gancthev V., and Nicolas O. Guevara R., all of Bolivar, Venezuela, assignors to C.V.G. Siderurgica del Orinoco, C.A., Bolivar, Venezuela

Continuation-in-part of Ser. No. 455,232, Dec. 22, 1989, which is a continuation-in-part of Ser. No. 115,911, Nov. 25, 1987, abandoned. This application Apr. 20, 1990, Ser. No. 512,216
The portion of the term of this patent subsequent to Nov. 12, 2008, has been disclaimed.
Int. Cl.[5] C21B *13/02, 13/14*
U.S. Cl. 75—495 **18 Claims**



1. A process for the production of liquid steel from iron-containing metal oxides comprising:

(a) providing a reforming-reduction reactor having a bed of partially metallized iron oxide material and a bed of direct reduced iron within said reforming-reduction reactor;

(b) feeding iron-containing metal oxides to the reforming-reduction reactor;

(c) providing a melting furnace having a melting zone;

(d) mixing top gas recycled from said reforming-reduction reactor with natural gas;

(e) preheating said top gas and natural gas mixture to a temperature in the range of from about 650° to about 850° C.;

(f) mixing air preheated to a temperature in the range of from about 650° C. to about 750° C. with said preheated top gas and natural gas mixture in a mixing chamber;

(g) partially combusting said mixture to a temperature of between 850° C. to 1100° C. wherein said mixture has a degree of oxidation in the range of from about 0.30 to about 0.35 and a reducing power in the range of form about 2 to 3;

(h) feeding said partially combusted mixtured to said direct reduced iron in said reforming-reduction reactor so as to form a reformed reducing gas comprising H_2 and CO and having an oxidation degree in the range of from about 0.05 to about 0.08 in said reforming-reduction reactor;

(i) contacting said iron-containing metal oxides in said reforming-reduction reactor with said reformed reducing gas so as to effect reduction to obtain a direct reduced iron;

(j) withdrawing said direct reduced iron from said reforming-reduction reactor;

(k) contacting said DRI metallized iron in said melting zone of said melting furnace with a material selected from the group consisting of preheated scrap, liquid metal, metallic iron, and mixtures thereof and melting said material in said melting zone; and

(l) withdrawing top gas from said reforming-reduction reactor and feeding said top gas as a fuel source to said melting furnace for heating said melting zone so as to melt said DRI metallized iron and material.

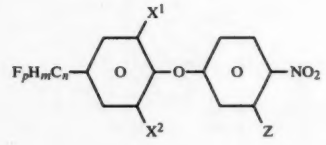
5,069,717

ANTIALGAL COMPOSITIONS COMPRISING DIPHENYLETHERS AND LYSOZYME, METHODS OF CONTROLLING ALGAE, AND COATING COMPOSITIONS COMPRISING THE ANTIALGAL COMPOSITIONS

Samuel E. Sherba, Willingboro, N.J., and Rai J. Mehta, Gujarat, India, assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 3, 1991, Ser. No. 637,084
Int. Cl.[5] C09D *5/14*
U.S. Cl. 106—18.35 **21 Claims**

1. A microbicidal composition useful for controlling algae comprising a synergistic mixture a first component of which is (A) a compound of the formula



wherein

X^1, X^2 are independently selected from hydrogen, halogen, trihalomethyl, cyano, or (C_1–C_4)alkyl, and

Z is selected from the group consisting of hydrogen, halogen, cyano, carboxy or salt thereof, lower alkylthio, lower carbalkoxy, lower carboxyalkyl, lower carbalkoxyalkyl, lower carbalkoxyalkoxycarbonyl, lower carbalkoxyalkoxy, lower alkoxy, lower cycloalkoxy, lower alkenyl, lower alkyl, lower cycloalkyl, unsubstituted or substituted lower alkyl amino, R^2O in which R^2 represents a hydrogen atom or an ester bonded acid radical of an inorganic or organic oxyacid;

p is an integer from 1 to 2n+1;

m is an integer of 0 to 2n;

n is an integer of 1 to 5;

$$m+p=2n+1$$

and a second component of which is (B) lysozyme wherein the ratio of the first component to the second component is in a range of from about 0.0005/1 to about 10/2.

5,069,718

POTASSIUM SUBSTITUTED INKS FOR INK-JET PRINTERS

William D. Kappele, San Marcos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 350,078, May 10, 1989, abandoned. This application Nov. 5, 1990, Ser. No. 609,042
Int. Cl.[5] C09D *11/02*
U.S. Cl. 106—22 **21 Claims**

1. A process for preparing an ink composition comprising a vehicle and a copper phthalocyanine dye having associated therewith at least one negatively charged functional group with which a first cation species is associated, said ink composition suitable for use in ink-jet printing, said process comprising:

(a) replacing said first cation species on said dye with potassium cations to form an ion-exchanged dye; and

(b) admixing said ion-exchanged dye with said vehicle to form said ink.

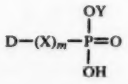
5,069,719

ORGANIC SOLVENT BASED INK COMPOSITION

Takashi Ono, Takatsuki, Japan, assignor to Orient Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 21, 1990, Ser. No. 631,465
Int. Cl.[5] C09D *11/00, 31/00;* **C09B** *27/00*
U.S. Cl. 106—22 **9 Claims**

1. An organic solvent based ink composition comprising a dye and an organic solvent, wherein said dye is represented by



[1]

wherein D represents a residue of an azo or anthraquinone dye which does not have a sulfone group and a carboxyl group, X represents an oxygen atom or a methylene group, Y represents a C_2–C_{12} alkyl group, a C_2–C_4 hydroxyalkyl group, a C_2–C_{12} alkoxyalkyl group, a polybutyral residue, a polyvinyl alcohol residue, a phenol resin residue, or a cellulose residue and m shows 0 or 1.

5,069,720

METHOD AND COMPOSITION FOR THE REDUCTION OF AMMONIA EMISSIONS FROM NON-ACIDIC RESIDUE

William R. Epperly, New Canaan, and Barry N. Sprague, West Haven, both of Conn., assignors to Fuel Tech, Inc., Rowayton, Conn.

Filed Jun. 17, 1988, Ser. No. 208,992
Int. Cl.[5] C04B *7/35*
U.S. Cl. 106—287.35 **24 Claims**

1. A method of reducing ammonia emissions to the environment from non-acidic residue formed from the combustion of a carbonaceous fuel, such residue containing ammonium salts or absorbed ammonia, the method comprising applying to the surface of the residue a layer of a physical barrier composition, under conditions effective to reduce the emission of ammonia from the residue.

11. A method of reducing ammonia emissions to the environment from non-acidic residue formed from the combustion of a carbonaceous fuel, such residue containing ammonium salts or absorbed ammonia, the method comprising applying to the residue a chemical barrier composition, under conditions effective to reduce the emission of ammonia from the residue.

5,069,721

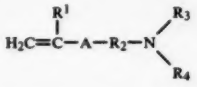
MORTAR CONCRETE COMPOSITION

Akira Tamura; Naotaka Watanabe, both of Tokyo; Hitoshi Fujiyoshi, and Masako Shirota, both of Yokohama, all of Japan, assignors to Mitsui-Cyanamid, Ltd., Tokyo, Japan

Filed Mar. 22, 1990, Ser. No. 497,254
Claims priority, application Japan, Apr. 13, 1989, 1-91882
Int. Cl.[5] C04B *7/02, 24/14, 24/10;* **C08K** *3/26*
U.S. Cl. 106—724 **5 Claims**

1. A repairing or reinforcing mortar.concrete composition, which is prepared by adding glass fibers, steel fibers, stainless steel fibers, carbon fibers, or high polymer fibers or a fine powder of ferrosilicon to a blend of raw materials for a mortar.concrete composition comprising about 2 to 120 parts by

weight of a polymer emulsion, 100 parts by weight of a portland cement material and about 0 to 500 parts by weight of an aggregate, wherein the polymer emulsion is prepared by neutralizing a seed polymer with an acid or a salt or by quaternizing it with a quaternizing agent, the surfaces of the emulsion grains being thereby highly densely cationated, where the seed polymer is formed by adding a monomer as represented by the following formula (I) or a mixture of the monomer (I) and copolymerizable ethylenic unsaturated monomer(s) to a seed latex of a carboxyl-modified synthetic rubber latex or synthetic resin emulsion and polymerizing them:



(I)

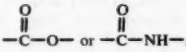
in which

R_1 represents H or CH_3;

R_2 represents an alkylene group having from 2 to 5 carbon atoms;

R_3 and R_4 each represent H or an alkyl group having from 1 to 5 carbon atoms;

A represents



and

R_1, R_3 and R_4 are so selected that the monomer is hardly soluble or insoluble in water,

when the polymer emulsion is blended with the cement material and aggregate.

5,069,722

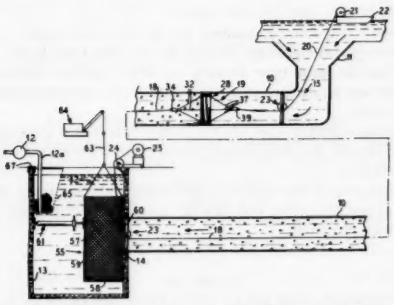
CLEANING ZEBRAMUSSELS FROM WATER PIPES

Patrick M. Murphy, 312 Rockwood Dr., Painesville, Ohio 44077

Filed Jul. 5, 1990, Ser. No. 548,554

Int. Cl.[5] B08B *9/06, 9/087*

U.S. Cl. 134—22.11 **13 Claims**



1. A method of cleaning and disposing of zebra mussels incrustation from a passage wall within a water pipe having one end immersed in a zebra mussel infested body of water, comprising:

dislodging the zebra mussels incrustation from the passage wall;

running flushing water through the pipe and discharging the water and the dislodged zebra mussels incrustation from the pipe into a porous collecting basket;

collecting the dislodged incrustation in the basket and separating the water from the basket through its porosity; and

from time-to-time removing the basket and clearing the collected dislodged incrustations from the basket.

5,069,723

METHOD FOR CONTROLLING DUST IN GRAIN

Howard W. Cole, Jr., First and Main Sts., Burgin, Ky. 40310, and Stephen E. Taylor, Bardstown, Ky., assignors to Howard W. Cole, Jr., Burgin, Ky.

Continuation-in-part of Ser. No. 333,422, Apr. 4, 1989. This application Nov. 9, 1989, Ser. No. 433,768

The portion of the term of this patent subsequent to Aug. 13, 2008, has been disclaimed.

Int. Cl.[5] B08B *9/20*

U.S. Cl. 134—25.1 **7 Claims**

1. A method for suppressing dust in grain transfer systems, comprising:

mixing air, water and an edible surfactant having an expansion factor of between 20–40 together at ambient temperature;

pumping said air, water, and an edible surfactant in a continuous manner under high pressure through a tortuous path in a foaming apparatus, to produce an edible foam capable of retaining its structure as a foam capable of being mixed with particles of grain and the like and having composed of small bubbles of a size distribution in the range of 500–200 microns in diameter;

placing at least one foam injection means at one or more locations within the grain transfer system where dust is likely to be generated;

pumping said edible small bubble foam to said areas of said grain transfer system where dust generation is likely; and

spray-injecting said edible small bubble foam into said grain as it is being transferred within said grain transfer system to effect a mixing of said edible small bubble foam with and into the grain to promote contact between said edible small bubble foam and the grain and grain dust particles, whereby said small bubbles of said edible small bubble foam rupture, wetting at least said grain dust particles and promoting adhesion of said grain dust particles to one another and other said grain particles to effect suppression of said grain dust.

5,069,724

METHOD OF CLEANING CARBON MEMBER CONTAMINATED WITH INORGANIC DEPOSITS

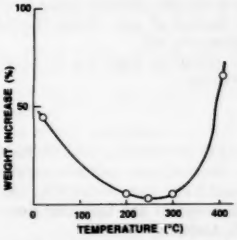
Yoshiyuki Kobayashi, Ube; Takashi Suehaga, Yamaguchi; Isamu Mouri, and Tukasa Fujii, both of Ube, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Jul. 5, 1990, Ser. No. 548,412

Claims priority, application Japan, Jul. 10, 1989, 1-177384

Int. Cl.[5] B08B *5/00*

U.S. Cl. 134—37 **10 Claims**



1. A method of cleaning a carbon member contaminated with inorganic deposits, the method comprising the step of bringing a cleaning gas into direct contact with the contaminated carbon member at a temperature in the range from about 200° C. to about 300° C., said cleaning gas consisting essentially of 1–20 vol % of ClF_3 gas and the balance of an inactive diluent gas.

5,069,725

METHOD AND APPARATUS FOR CLEANING LAYERS OF EARTH

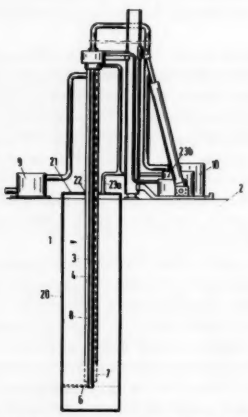
Joachim Fischer, Dormagen, and Andreas Müonning, Düsseldorf, both of Fed. Rep. of Germany, assignors to Philipp Holzmann Aktiengsellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 31, 1989, Ser. No. 332,260

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1988, 3810941; Dec. 24, 1988, 3843836

Int. Cl.[5] B08B *3/02*

U.S. Cl. 134—42 8 Claims



1. In a method of cleaning layers of earth that contain noxious material, including the steps of introducing cleaning medium into said earth layers under high pressure to effect separation of said noxious material on the spot from loosened earth particles, and the further step of removing said noxious material with said cleaning medium and returning same to the surface of the ground, the improvement comprising the steps of:

a. providing a tubular chamber means that is downwardly open in a direction of introduction into the ground;

b. introducing said tubular chamber means into the ground in a substantially vertical direction and defining a treatment zone therewith;

c. carrying out a cleaning process in said tubular chamber means, with said cleaning process progressing in a vertical direction, and with said cleaning medium reaching an inner surface of said tubular chamber means and thus being applied to the entire soil enclosed in said tubular chamber means;

d. removing said tubular chamber means from the ground;

e. shifting the position of said tubular chamber means in a horizontal direction; and

f. successively repeating steps b–e to advance a ground cleaning operation.

5,069,726

CERAMIC COATED WIRES AND THERMOCOUPLES

Clive L. Ragless, Bedford Park, Australia, assignor to Industrial Pyrometers (Aust.) Pty Ltd., Richmond, Australia and The Commonwealth Scientific and Industrial Research Organisation, Campbell, Australia

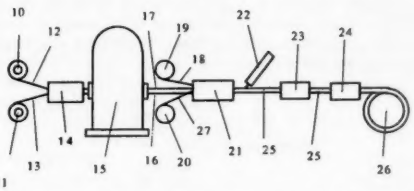
Filed Apr. 10, 1990, Ser. No. 507,142

Claims priority, application Australia, Apr. 11, 1989, PJ3625; Apr. 26, 1989, PJ3896

Int. Cl.[5] H01L *35/34, 37/00*

U.S. Cl. 136—201 12 Claims

1. A method of providing an electrically insulating flexible adherent ceramic coating on a wire comprising annealing the wire to stabilize the surface topography of the wire, depositing a thin film layer of ceramic material by vacuum-based vapor deposition on the surface of the wire, the said ceramic material having a co-efficient of thermal expansion substantially similar to that of the wire, the deposition being carried out while the wire is at a temperature of between 200° C. and 1400° C., and



heating the wire after deposition of the ceramic for sufficient time for the ceramic layer to crystallize to form an impervious scratch resistant, adherent and flexible layer on the surface of the wire, said layer being from about 0.3 micrometers to about 1.5 micrometers in thickness.

5,069,727

FLEXIBLE PHOTOVOLTAIC DEVICE AND MANUFACTURING METHOD THEREOF

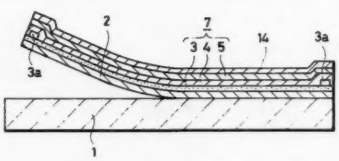
Shinichi Kouzuma; Hiroshi Inoue; Kenji Murata; Hiroyuki Tanaka, and Yasuo Kishi, all of Osaka, Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Sep. 5, 1990, Ser. No. 578,088

Claims priority, application Japan, Sep. 6, 1989, 1-104660; Sep. 18, 1989, 1-242768; Sep. 27, 1989, 1-252665

Int. Cl.[5] H01L *31/048, 31/18*

U.S. Cl. 136—251 19 Claims



1. A flexible photovoltaic device comprising:

a first transparent, insulating, and flexible resin layer,

a transparent electrode formed on said first resin layer,

a flexible resin type locking member having adherence formed along the inner periphery of said transparent electrode,

a semiconductor layer formed so as to cover said transparent electrode and said locking member for photoelectric conversion,

a back electrode formed on said semiconductor layer, and

a second insulating and flexible resin layer formed on said back electrode.

5,069,728

PROCESS FOR HEAT TREATING METALS IN A CONTINUOUS OVEN UNDER CONTROLLED ATMOSPHERE

Yannick Rancon, Velizy, and Eric Duchateau, Versailles, both of France, assignors to l'Air Liquide, Societe Anonyme Pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Jun. 26, 1990, Ser. No. 543,581

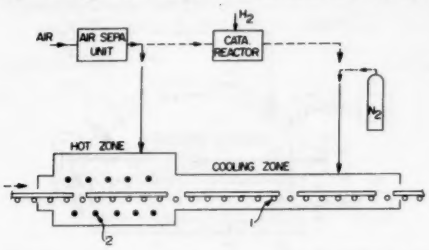
Claims priority, application France, Jun. 30, 1989, 89 08786

Int. Cl.[5] C21D *1/74*

U.S. Cl. 148—16 8 Claims

1. A process for heat treating metal, comprising continuously conveying the metal through an elongated treatment chamber having a first upstream heating zone and a second

downstream cooling zone, continuously introducing from outside said chamber into said first zone a gas consisting essentially of nitrogen containing between 0.5 to 5% of oxygen plus



reducing gas in an amount at least sufficient to react with and eliminate said oxygen, and continuously introducing from outside said chamber into said second zone a gas consisting essentially of nitrogen which is substantially oxygen-free.

5,069,729

Patent Not Issued For This Number

5,069,730

WATER-SOLUBLE SOLDERING PASTE

Courtney V. Dodd, Oklahoma City, Okla.; John R. Morris, Cranbury, N.J., and Gregory C. Munie, Naperville, Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jan. 28, 1991, Ser. No. 646,556
Int. Cl.[5] B23K *35/34*
U.S. Cl. 148—23 **12 Claims**

1. A water-soluble soldering paste for solder bonding components to a substrate and for effectively preventing absorption of hydrophilic material into the substrate to allow the substrate to maintain a high Surface Insulation Resistance (SIR) following soldering, comprising:

powdered solder;

a water-soluble soldering flux containing at least a water-soluble vehicle and an activator;

a hydrophobic surfactant which is preferentially adsorbed over the flux vehicle by the surface of the substrate to render the substrate surface substantially hydrophobic; and

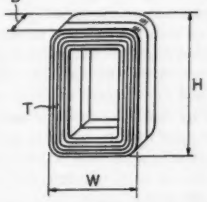
a solvent in which the water-soluble flux and the hydrophobic surfactant are dissolved.

5,069,731

LOW-FREQUENCY TRANSFORMER

Yoshihito Yoshizawa, and Kiyotaka Yamauchi, both of Saitama, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Mar. 23, 1989, Ser. No. 327,882
Claims priority, application Japan, Mar. 23, 1988, 63-68825
The portion of the term of this patent subsequent to Nov. 21, 2006, has been disclaimed.
Int. Cl.[5] H01F *1/04*
U.S. Cl. 148—305 **8 Claims**



1. A low-frequency transformer comprising a magnetic core made of an alloy having the composition represented by the general formula:

$$(Fe_{1-\alpha}M_\alpha)_{100-x-y-z-\alpha}Cu_xSi_yB_zM'_\alpha \quad \text{(atomic \%)}$$

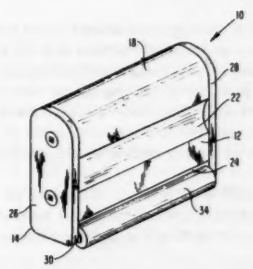
wherein M is Co and/or Ni, M' is at least one element selected from the group consisting of Nb, W, Ta, Mo, Zr, Hf and Ti, and a, x, y, z and α respectively satisfy $0 \leqq a \leqq 0.3$, $0.1 \leqq x \leqq 3$, $0 \leqq y \leqq 17$, $4 \leqq z \leqq 17$, $10 \leqq y+z \leqq 28$ and $0.1 \leqq \alpha \leqq 5$, at least 50% of the alloy structure being occupied by fine crystal grains having an average grain size of 1000Å or less when measured by their maximum diameters.

5,069,732

HAND-HELD LAMINATING ROLLER

Peter Levine, Pequannock, N.J., assignor to Sabel, Inc., Pequannock, N.J.

Filed Apr. 26, 1990, Ser. No. 514,740
Int. Cl.[5] E04F *13/00*
U.S. Cl. 156—71 **16 Claims**



1. A hand tool for the application of pressure by a user to the surface of a laminar structure during the mounting thereof to a substrate, said hand tool comprising, in combination:

a pressure block with a notched corner, said pressure block, in turn, further comprising:

a base portion having substantially parallel upper and lower faces and dimensioned to fit the hand of the user, said lower face extending to said notched corner, said base portion, in turn further comprising;

groove means for accommodating, when the tool is grasped by the user, the fingertips of the user, said groove means situated in the lower face of the pressure block and substantially parallel to said shaft;

a pair of side plate portions, one on each side of said base portion, with one of the pair being the mirror image of the other, each having in a corresponding corner thereof an opening therein to receive one end of a shaft, said side plate portions arranged to extend beyond the side of the base portion and to have the shaft opening coincident with the notched corner of the pressure block;

a shaft adapted to be fixedly captive within said shaft openings in said side plate portions and to be housed within the notched corner of said pressure block; and,

a tubular roller of a first material mounted coaxially with and rotatably about said shaft and extending substantially along the exposed length of the captive shaft;

whereby, while mounting a laminar structure to a substrate, with the user's hand about the pressure block and the heel of his hand above the roller, pressure is provided by the user pushing the roller cover against the surface of the laminar structure.

5,069,733

METHOD OF MANUFACTURING THE LUMINESCENT SCREEN OF A DISPLAY DEVICE

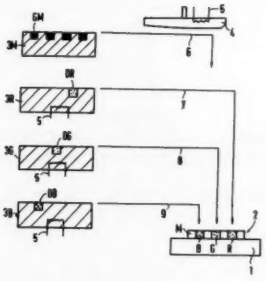
Eberhard Nill, Oberesslingen, and Kurt M. Tischer, Wendlingen, both of Fed. Rep. of Germany, assignors to Nokia Unterhaltungselektronik, Pforzheim, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 169,403, Mar. 17, 1988, abandoned. This application Jun. 29, 1989, Ser. No. 374,619

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1987, 3709206

Int. Cl.[5] B44F *1/00*; B32B *31/00*

U.S. Cl. 156—67 **13 Claims**



1. A method of forming a luminescent screen having a predetermined pattern on the inside surface of a flat faceplate of a color display device, said method comprising the steps of:

providing a plurality of printing blocks each having a flat surface with wells formed therein in a pattern, the patterns of each printing block being combinable to form a composite pattern corresponding to the predetermined pattern;

filling said wells with printing ink formed of a mixture of hot-melt adhesive and a luminescent material;

heating said printing blocks so that the printing ink becomes liquid;

providing at least one cylindrical transfer device; and

sequentially printing the pattern of each printing block onto the flat surface of the faceplate by rolling the cylindrical transfer device over a flat surface of the printing block to take up printing ink from said wells, and thereafter rolling the cylindrical transfer device over the inside of said flat faceplate to deposit printing ink on said flat faceplate and repeating said rolling steps for each printing block, whereby the printing ink from each rolling step remains on the inside of the faceplate and forms said predetermined pattern.

5,069,734

DIMENSIONAL STABILIZING PROCESS

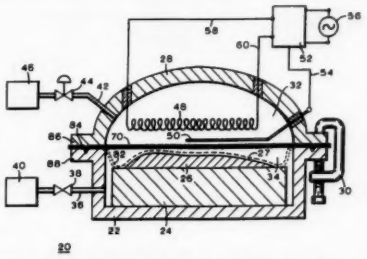
Dean L. Kavanagh, and Robert H. M. Simon, both of Longmeadow, Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 18, 1990, Ser. No. 539,251

Int. Cl.[5] B32B *31/20*

U.S. Cl. 156—84 **17 Claims**

1. A method of dimensionally stabilizing a transparent, shrinkable thermoplastic layer in a draw-formed laminate, said thermoplastic layer carrying one or more performance layers or coatings and being bonded in the laminate with layers of plasticized polyvinyl butyral, said process comprising heat



setting the thermoplastic layer by heating the laminate while holding the laminate against the surface of a shaping mold.

5,069,735

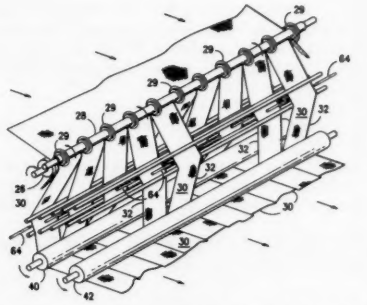
APPARATUS FOR PRODUCING SEALED EDGE KNIT WIPING CLOTHS

James R. Reynolds, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Jun. 4, 1990, Ser. No. 532,798

Int. Cl.[5] D06C *25/00*

U.S. Cl. 156—497 **3 Claims**



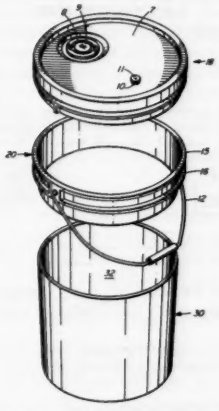
1. Apparatus to provide a plurality of sealed edge products from a continuous wide width of fabric comprising: a roll of fabric rotably mounted in a roll stand, a cutter means having a plurality of cutters thereon spaced from another rotably mounted in said apparatus, means to supply fabric from the roll of fabric to said cutter means to cut the fabric into a plurality of strips of fabric, hot air supply means adjacent and outside the path of travel of the cut strips of fabric to heat and melt each of the selvages of the strips of fabric passing thereby, a conveyor means receiving the edge sealed strips of fabric from said cutter means, suction means operably associated with said conveyor means to hold the strips of fabric thereon, a laser cutter mounted above conveyor to cut the strips of fabric in the cross-machine direction, a collection table means adjacent said conveyor means and drive means to rotate said conveyor to deliver fabric cut by said laser cutter to said collection table means, said hot air supply means including a plurality of air jets with an air jet mounted outside and on each side of the path of travel of each of the cut strips of fabric, each of said jets being directed towards the path of travel of the cut strips and having its center axis parallel to the cross-machine direction of said apparatus.

5,069,736

METHOD OF PAIL CONSTRUCTION

Randall D. Castle, Post Office Box 204, New Hazelton, British Columbia, Canada V0J 2J0

Filed Aug. 20, 1990, Ser. No. 569,479
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—94 6 Claims



1. A method of constructing a reinforced pail from an existing pail having a top end, a cover secured over said top end, a closed bottom end, and a cylindrical side wall tapering outwardly between said bottom end and said top end, said method comprising the steps of:

(a) forming an annular ring from a top portion of said side wall by removing said top cover and cutting said side wall around a lower periphery parallel to and spaced below said top end, thereby forming a modified pail having an open top end at the height of said lower periphery;

(b) sliding said ring as a concentric sleeve over said modified pail to a position where said ring snugly engages and reinforces said modified pail; and,

(c) securing said ring to said modified pail in said position.

5,069,737

STRUCTURAL MATERIALS

Jeremy D. L. Guiton, London, United Kingdom, assignor to Shell Internationale Research Maatschappij B.V., The Hague, Netherlands

Filed Dec. 13, 1989, Ser. No. 449,180
Claims priority, application United Kingdom, Dec. 14, 1988, 8829198
Int. Cl.[5] B31F *1/20;* B29C *47/00*
U.S. Cl. 156—210 1 Claim

1. A method of forming a double skin construct panel, said method comprising the steps of:

laying up a first face skin laminate;

marking the locations of a first set of core formers on the first face skin laminate;

positioning strips of lower masking strip over the marked locations of the first set of core formers;

layers up lower layers of fiber and resin with the edges of the lower layers overlapping the lower masking strips;

securing the first set of core formers in position above the lower layers of fiber and resin, the core formers spaced evenly from the edges of the lower edges of fiber and resin;

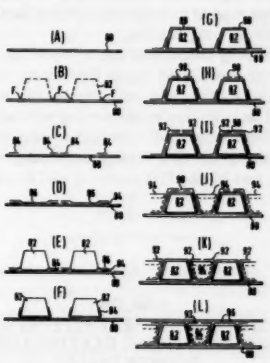
raising the lower masking strips so as to press the edges of the lower layers of fiber and resin against the sides of the first set of core formers;

removing the lower masking strips;

laying up continuous layers of fibers and resin over the top of the first set of core formers, the continuous layers lapping onto the first face skin laminate alongside the first set of formers;

positioning upper masking strips along the crowns of the first set of core formers, on top of the continuous layers of fiber and resin

laying up upper layers of fiber and resin on top of said upper masking strips, the upper layers overlapping the top sides of the core sections,



positioning a second set of core formers in the regions between the first set of core formers;

raising the upper masking strips to fold the upper layers of fiber and resin on top of the second set of core formers;

removing the second set of masking strips; and

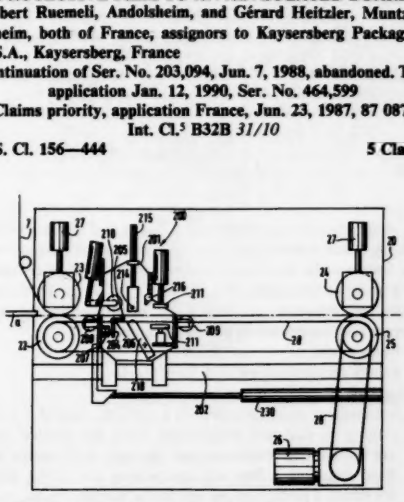
laying up a second face skin laminate on top of the upper layers of fiber and resin contacting the second set of core formers, and on top of the continuous layer of fiber and resin on top of the first set of core formers.

5,069,738

PROCESS AND DEVICE FOR APPLYING A PROTECTIVE FILM TO AN ALVEOLATED BOARD

Robert Ruemeli, Andolsheim, and Gérard Heitzler, Muntzenheim, both of France, assignors to Kaysersberg Packaging, S.A., Kaysersberg, France

Continuation of Ser. No. 203,094, Jun. 7, 1988, abandoned. This application Jan. 12, 1990, Ser. No. 464,599
Claims priority, application France, Jun. 23, 1987, 87 08793
Int. Cl.[5] B32B *31/10*
U.S. Cl. 156—444 5 Claims



1. Device for applying a protective film to alveolar structured boards with two flat spaced panels coupled by partitions integral therewith and making longitudinal cavities comprising:

means for driving the said boards in line in a flat translation movement, two successive boards (a and b) being sepa-

rated by a distance e which is at least equal to their thickness;

means for depositing a film of flexible material on one flat panel of the first board (a), then on the second board (b) in such a manner that said film extends over said distance e;

means for transversely cutting said film present over said distance e provided between boards (a and b) so as to obtain at least one free part of said film;

means for folding said at least one free part onto a side of one of the boards so as to cover the cavities, said means comprising air blowing nozzles;

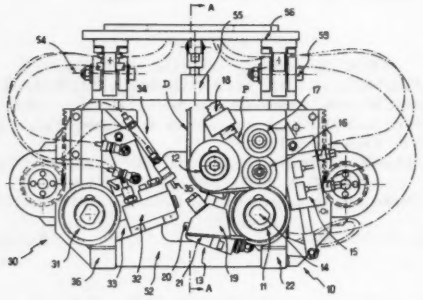
means for sealing said at least one free part folded onto said side to the board; said means for cutting said film, said means for folding and said means for sealing being mounted on a carriage means moving with said boards and being temporarily rigidly coupled to said boards during said cutting of said film, folding and sealing of said at least one free part of said film to one of said boards.

5,069,739

AUTOMATIC FLEXIBLE SEAL FITTING MACHINE, SUITABLE FOR FITTING GLAZING UNIT AND WINDOW SEALS

Jean-Jacques Kautt, Strasbourg, France, assignor to Ferco International Usine de Ferrures de Batiment, Sarrebourg, France

Filed Mar. 30, 1990, Ser. No. 501,837
Claims priority, application France, May 17, 1989, 89 06441
Int. Cl.[5] B32B *31/18*
U.S. Cl. 156—468 **15 Claims**



1. A machine for automatically fitting a seal into a window opening frame comprising frame feed means for feeding window frames to be fitted with said seal, means for determining characteristics and dimensions of a frame fed by the frame feed means and manipulation means for manipulating the seal, wherein said manipulation means comprises:

a framework;

a gantry movable along said framework;

a carriage movable along said gantry; and

a manipulator head mounted on a vertical shaft of the carriage such that said manipulator head and vertical shaft are rotatable in relation to said carriage, said manipulator head including a first unit comprising first fitting means for fitting a portion of the seal into a window frame, guide means for guiding the seal to said first fitting means and cutting means for cutting the seal, and a second unit comprising second fitting means for fitting a portion of a cut seal against the window frame,

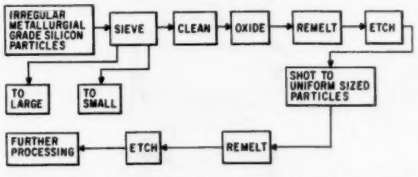
wherein each of said first and second units are vertically movable between an upper position and a lower position.

5,069,740

PRODUCTION OF SEMICONDUCTOR GRADE SILICON SPHERES FROM METALLURGICAL GRADE SILICON PARTICLES

Jules D. Levine, Dallas, and Millard J. Jensen, Balch Springs, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 647,551, Sep. 4, 1984, abandoned. This application Apr. 21, 1988, Ser. No. 185,334
Int. Cl.[5] C30B *11/02*
U.S. Cl. 156—616.2 **22 Claims**



1. A method of forming high purity semiconductor material from relatively low purity semiconductor material, comprising the steps of:

(a) treating particles of relatively low purity semiconductor material to form a skin thereon of a thermally stable compound;

(b) melting the material within said skin while retaining said molten material within said skin to cause impurities in said material to travel into said skin;

(c) cooling the material to form a single crystal solid material within said skin;

(d) removing said skin from said particles; and

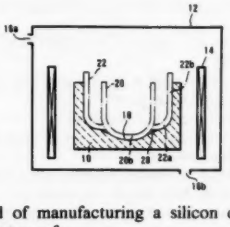
(e) repeating at least once the steps (a) through (d) on said particles.

5,069,741

METHOD OF MANUFACTURING QUARTZ DOUBLE CRUCIBLE ASSEMBLY

Michio Kida, Urawa, and Kensho Sahira, Yono, both of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 170,356, Mar. 18, 1988, abandoned. This application Sep. 27, 1989, Ser. No. 413,213
Claims priority, application Japan, Mar. 20, 1987, 62-67128
Int. Cl.[5] C30B *15/52*
U.S. Cl. 156—617.1 **7 Claims**



1. A method of manufacturing a silicon crystalline rod, comprising the steps of:

(a) providing a Czochralski furnace and a graphite susceptor housed in said furnace;

(b) producing an inner quartz crucible by means of arc fusion method, said inner crucible being defined by a vertical wall of a cylindrical shape and a bottom having a convexly curved portion adjacent to said vertical wall, said inner crucible being provided with at least one aperture formed therethrough;

(c) producing an outer quartz crucible larger in diameter than said inner crucible by means of arc fusion method,

said outer crucible being defined by a bottom portion and a peripheral wall extending from said bottom portion, said bottom portion being provided with a through opening of such a size as to be smaller in diameter than said vertical wall of said inner crucible;

(d) receiving said outer crucible in said susceptor with said peripheral wall and said bottom portion substantially mated with the inner surface of said susceptor and receiving said inner crucible in said outer crucible in such a manner that said through opening of said outer crucible is obturated by said bottom of said inner crucible and that a periphery of said opening is located under said convexly curved portion of said bottom of said inner crucible, said inner crucible being free from fixed interconnection with said outer crucible;

(e) subsequently charging said inner crucible with a silicon polycrystal material;

(f) subsequently operating said furnace to heat said outer and inner crucibles to a temperature between 1,500° C. and 1,600° C. to thereby cause said outer and inner crucibles to be fixedly joined together to produce a double quartz crucible and to cause the silicon polycrystal material in said inner crucible to melt;

(g) subsequently immersing a seed crystal in the silicon material melt; and

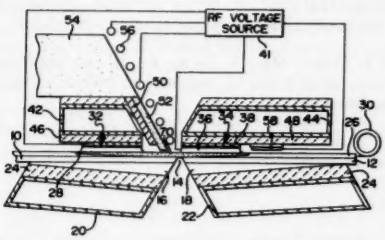
(h) subsequently pulling out said seed crystal from the melt while supplying a silicon material into said double crucible assembly.

5,069,742

METHOD AND APPARATUS FOR CRYSTAL RIBBON GROWTH

Carl E. Bleil, 132 Chalmers Dr., Rochester, Mich. 48063

Filed Feb. 5, 1990, Ser. No. 475,398
Int. Cl.[5] C30B *13/30*
U.S. Cl. 156—620.7 **3 Claims**



1. A method of growing a crystal ribbon from source material comprising the steps of:

electrically heating a body of source material by primary current to form and maintain a molten film having surfaces substantially coplanar with the desired ribbon,

cooling one surface of the film to effect ribbon growth, wherein the combined heating and cooling steps control the temperature gradient in the film normal to the film surface,

moving the ribbon parallel to the surface in an axial direction away from the molten film, and

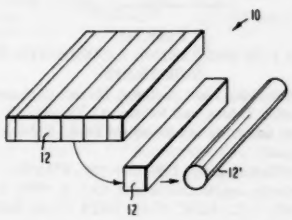
preventing dendritic structure formation by controlling the axial temperature gradient in the ribbon adjacent the molten film to a low value by electrically heating the ribbon adjacent the molten film by current insufficient to melt the ribbon and controlled independently of the primary current, whereby formation of dendritic structure is prevented in the ribbon.

5,069,743

ORIENTATION CONTROL OF FLOAT-ZONE GROWN TIC CRYSTALS

Joseph A. Wysocki, Oxnard, and Frans G. Krajenbrink, Newbury Park, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Apr. 11, 1990, Ser. No. 508,137
Int. Cl.[5] C30B *13/00*
U.S. Cl. 156—620.7 **11 Claims**



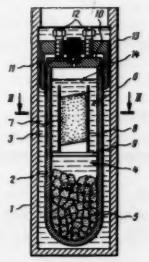
1. A process of growing single crystal titanium carbide ingot in a high pressure furnace by float-zone to establish a melt zone in a titanium carbide rod by an rf field and translating said rod relative to said field, said process comprising (a) translating said rod in an inert atmosphere of at least about 400 psi, (b) rotating said rod about its growth axis at a rate ranging from about 0.5 to 10 rpm, and (c) controlling the crystallographic orientation of said single crystal titanium carbide by controlling the temperature of said melt zone and the translation rate of said rod, said translation rate ranging from about 0.05 to 0.2 inch/hr.

5,069,744

PROCESS FOR PRODUCING SINGLE CRYSTALS OF OPTICAL CALCITE

Vadim L. Borodin, Ulitsa Oktyabrskaya, 4,kv.134; Valery V. Dronov, Ulitsa Gagarina, 17,kv.94, and Valentin E. Khadzhi, ulitsa Institutskaya, 14,kv.8, all of Alexandrov, U.S.S.R.

Filed Oct. 10, 1990, Ser. No. 595,308
Claims priority, application U.S.S.R., Oct. 26, 1989, 4750251
Int. Cl.[5] C30B *7/10*
U.S. Cl. 156—623 R **3 Claims**



1. A process for producing single crystals of optical calcite by a hydrothermal method in an insertion container filled with an aqueous solution of ammonium halide and arranged in an autoclave, comprising the steps of:

1) locating crystalline calcium carbonate and at least one seed plate in said insertion container;

2) arranging at least one seed plate vertically in the insertion container above said crystalline calcium carbonate which is located in the lower part of the insertion container;

3) screening the side surfaces of said seed plate by means of vertically arranged screens;

4) hermetically sealing the insertion container and autoclave;

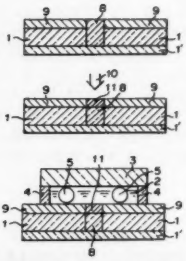
5) heating the autoclave and insertion container to a temperature of hydrothermal synthesis;
6) maintaining the pressure in the insertion container and autoclave within 80–85 MPa; and
7) conducting hydrothermal synthesis in which recrystallization is effected of said calcium carbonate from the ammonium halide aqueous solution on at least one seed plate with the presence of a temperature drop between the zones of location of calcium carbonate and at least one said seed plate equal to the range of T2–3K.

5,069,745

PROCESS FOR PREPARING A COMBINED WIRING SUBSTRATE

Hirofumi Ohuchida; Eishi Gofuku; Hayato Takasago; Akira Ishizu; Toshio Tobita, and Mitsuyuki Takada, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1990, Ser. No. 571,876
Claims priority, application Japan, Oct. 3, 1989, 1-259280
Int. Cl.[5] B44C *1/22*; B29C *37/00*; B32B *31/00*; B23K *26/00*
U.S. Cl. 156—630 **9 Claims**



9. A process for preparing a combined liquid crystal display which comprises:
a step of bonding with an adhesive agent of a high polymeric material the end surfaces of the mutually opposing sides of a plurality of substrates,
a step of irradiating laser beams to a portion of the adhesive agent which projects from the surface of the substrates by the press-contacting of them to thereby etch that portion so that the difference in level to the surface of the substrates is under 5 μm, and
a step of arranging an opposing substrate above the substrate with a gap and sealing a liquid crystal in the gap.

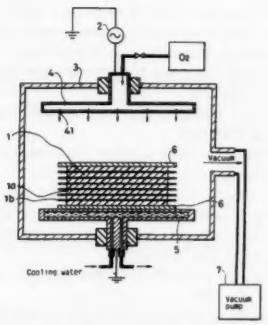
5,069,746

METHOD FOR MANUFACTURING A FILM CAPACITOR

Tadashi Kimura, Kobe, and Tanejiro Ikeda, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 7, 1990, Ser. No. 476,054
Claims priority, application Japan, Feb. 7, 1989, 1-28174
Int. Cl.[5] H01L *21/00*
U.S. Cl. 156—633 **4 Claims**

1. A method for manufacturing a film capacitor comprising the steps of:
placing a film capacitor body comprising multiple layers of alternating plastic films and electrodes in a plasma etching chamber; Masking each of an uppermost and lowermost of said layers to leave only side edges exposed;
discharging a plasma host gas in said plasma etching chamber;
selectively etching side edges of said films by contacting said film edges with said host gas to leave exposed protruding edges of said electrode layers said gas being excited to be reactive to selected parts of said plastic films by application of radio frequency power to said plasma etching chamber, said capacitor body being thereby heated by a reaction with said host gas, and;
forming at least one connection member on said exposed protruding edges of said electrode layers to form at least one edge terminal;
said radio frequency power for exciting said reactive gas and heating the film capacitor body being applied to said plasma etching chamber in a two-stage processing which comprises:



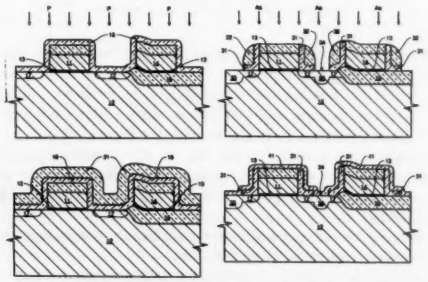
a first stage of applying a relatively large radio frequency power for generating sufficient amount of said reactive gas and for raising the temperature of said film capacitor body to a predetermined temperature which is close to but below a melting temperature of said plastic film within a predetermined value, and
a second stage, which is subsequent to said first stage, of applying a relatively small radio frequency power for maintaining said film capacitor body around said predetermined temperature, below said melting temperature.

5,069,747

CREATION AND REMOVAL OF TEMPORARY SILICON DIOXIDE STRUCTURES ON AN IN-PROCESS INTEGRATED CIRCUIT WITH MINIMAL EFFECT ON EXPOSED, PERMANENT SILICON DIOXIDE STRUCTURES

David A. Cathey; Mark E. Tuttle; Ruojia Lee, and Tyler A. Lowrey, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Dec. 21, 1990, Ser. No. 633,573
Int. Cl.[5] B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—643 **9 Claims**



1. A process for creating and removing temporary silicon dioxide structures on an in-process integrated circuit with minimal effect on existing permanent structures formed from conventional silicon dioxides that are exposed, said process comprising the following sequence of steps:
a) blanket deposition of an ozone-TEOS silicon dioxide layer

through chemical vapor deposition on top of the in-process integrated circuit, thus covering the permanent structures formed from conventional silicon dioxides;

b) etching said ozone-TEOS layer to create said temporary structures; and

c) removing said temporary structures.

5,069,748

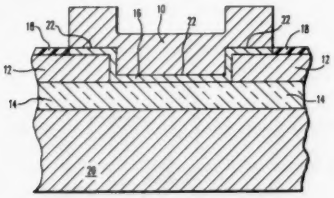
METHOD FOR FORMING REFRACTORY RESISTORS WITH ETCH STOP FOR SUPERCONDUCTOR INTEGRATED CIRCUITS

John X. Przybysz, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 359,018, May 30, 1989, Pat. No. 5,021,867. This application Jan. 22, 1991, Ser. No. 644,131

Int. Cl.[5] B44C *1/22*; C23F *1/02*

U.S. Cl. 156—643 **10 Claims**



1. A method for preparing molybdenum resistors in a superconductor integrated circuit; said method comprising:

a) depositing superconductor film on a support;

b) patterning said superconductor film to provide a patterned superconductor and exposed support;

c) applying an titanium film on said superconductor film and said exposed support;

d) applying a molybdenum film on said titanium film to provide an titanium-molybdenum, etch-stop interface;

e) applying a patterned resist film on said molybdenum film to provide exposed molybdenum film and unexposed molybdenum film;

f) etching said exposed molybdenum film to define the molybdenum resistor and expose a portion of said titanium-molybdenum, etch-stop interface; and

g) oxidizing said exposed titanium-molybdenum, etch-stop interface, whereby the titanium-molybdenum, etch-stop interface protects the patterned superconductor film and the support and increases processing margins for the etch time.

5,069,749

METHOD OF FABRICATING INTERCONNECT LAYERS ON AN INTEGRATED CIRCUIT CHIP USING SEED-GROWN CONDUCTORS

Jean-Marie Gutierrez, Shrewsbury, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 891,972, Jul. 29, 1986, abandoned. This application Aug. 29, 1988, Ser. No. 239,036

Int. Cl.[5] H01L *21/00*

U.S. Cl. 156—646 **24 Claims**

1. A method of forming a conductor-insulated layer on an integrated circuit chip comprising the steps of:

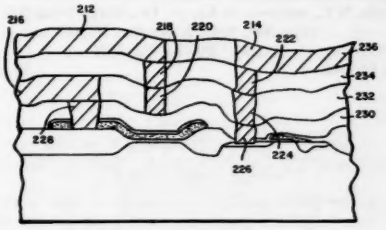
1) forming a layer of seed material over a surface of a chip,

2) patterning the seed material in a selected manner,

3) forming an insulating layer over the patterned seed material,

4) patterning the insulating layer to expose portions of the seed material,

5) exposing the chip to a first chemical agent which acts to selectively replace said exposed seed material with a conducting material, and



6) exposing the chip to a second chemical agent which selectively deposits further conductive material on the conductive material which has replaced the seed material.

5,069,750

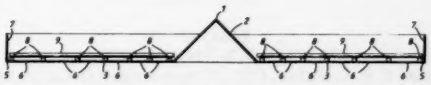
DISTRIBUTOR FOR A DEVOLATILIZER

Osman T. Aboul-Nasr, Leominster, Mass., assignor to Polysar Financial Services S.A., Fribourg, Switzerland

Filed Apr. 12, 1990, Ser. No. 507,734

Int. Cl.[5] B01D *1/22*

U.S. Cl. 159—2.001 **12 Claims**



1. In a falling strand devolatilizer a distributor comprising in cooperating arrangement:

(i) an upwardly tapering closed top projection, centrally located below a polymer melt inlet to said devolatilizer; said projection having at least one inclined face; and

(ii) a tray having a dimension greater than the base of said projection, and less than the diameter of the interior of the devolatilizer, said tray projecting substantially uniformally around and extending radially outwardly from said base of said projection, and comprising a base having a number of strand forming holes therethrough, said holes being of a dimension to form continuous strands of polymer melt, the dimension of said holes increasing toward the perimeter of said tray base; and a shallow weir extending around the perimeter of said tray.

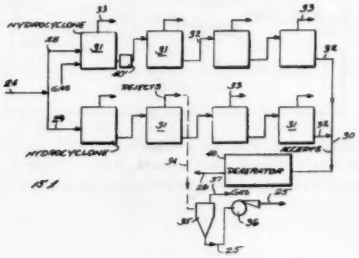
10. In a method of devolatilizing a polymer melt by passing it through a falling strand devolatilizer at a temperature from 210° to 220° C. and a pressure from 1 to 50 mm of Hg the improvement comprising impacting the polymer melt on the top of an upwardly tapering closed top projection to form an expanding downward flow of polymer, changing the downwardly flow of polymer to horizontal flow in an outwardly expanding direction over the surface of a perforated tray and passing the horizontally flowing polymer through holes of different sizes in said tray to form continuous strands of polymer melt, said strands of polymer melt being larger in cross-section the further the holes are from the downward flow, the residence time on the tray and in the strands is from 3 to 8 minutes.

5,069,751

HYDROCYCLONE DEINKING OF PAPER DURING RECYCLING

Wayne J. Chamblee, and Brian F. Greenwood, both of Glens Falls, N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed Aug. 9, 1990, Ser. No. 564,656
Int. Cl.[5] B03D 1/02, 1/24
U.S. Cl. 162—5 16 Claims



1. A method of deinking recycled paper cellulosic pulp, comprising the steps of sequentially and continuously:

(a) reducing paper having print thereon to a finely comminuted liquid-solids suspension flow having a solids consistency of about 1–4%;

(b) introducing the suspension into a first end of a vortex;

(c) sparging air into the suspension in the vortex, to cause ink particles to attach to air bubbles and move back toward the first end, a foam being formed of air and attached ink particles, while cellulosic pulp moves toward a second end in the vortex, opposite the first end; and

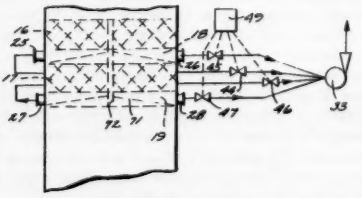
(d) removing the foam and pulp entrained in the foam from the vortex in a foam stream, and removing a pulp stream distinct from the foam stream.

5,069,752

DIGESTER SCREEN SWITCHING

Johan C. F. C. Richter, Oslo, Norway, assignor to Kamyr AB, Karlstad, Sweden

Filed Apr. 30, 1990, Ser. No. 516,519
Int. Cl.[5] D21K 7/14
U.S. Cl. 162—37 8 Claims



1. A method of withdrawing liquid from first and second vertically spaced annular screens in a vertical vessel in which material is treated utilizing high pressure steam, each having an annular header associated therewith and first and second circumferentially spaced liquid outlets associated with each header, the first outlet for the first screen being generally vertically in line with the first outlet for the second screen, and the second outlet of the first screen being generally vertically in line with the second outlet of the second screen; comprising the steps of sequentially:

(a) simultaneously withdrawing liquid from the first outlet of the first screen and the second outlet of the second screen;

(b) terminating the withdrawal in step (a);

(c) simultaneously withdrawing liquid from the second outlet of the first screen and the first outlet of the second screen;

(d) terminating the withdrawal in step (c); and

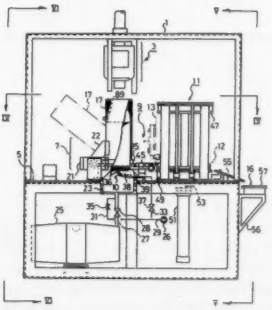
(e) repeating steps (a)–(d) with an appropriate frequency and so as to minimize abrupt variations in high pressure steam flow.

5,069,753

METHOD FOR MAKING DRY SHEET-LIKE SAMPLE OF SOLID PARTICLES FROM A SUSPENSION

Masahiro Nishi, Shizuoka, Japan, assignor to Kyoritsu Electric Corporation, Shizuoka, Japan

Filed Mar. 21, 1990, Ser. No. 496,702
Claims priority, application Japan, Jul. 19, 1989, 1-186374; Jul. 19, 1989, 1-186375; Jul. 19, 1989, 1-186376; Jul. 19, 1989, 1-186377; Jul. 19, 1989, 1-186378; Jul. 19, 1989, 1-186379
Int. Cl.[5] D21F 13/00; G01N 5/04
U.S. Cl. 162—49 1 Claim



1. A method of making a dry sheet-like sample of solid particles from a suspension, comprising the steps of:

(a) sampling a part of the suspension as it flows through a pipe or while it is retained in a storage tank

(b) stirring the thus-sampled suspension by supplying compressed air to the sampled suspension and then dewatering the stirred suspension on a filter by filtration with vacuum, thereby forming a wet sheet-like intermediate sample of solid particles deposited on the filter;

(c) conveying the filter and the wet sheet-like intermediate sample deposited thereon to a drying station comprising an upper hot plate and a lower hot plate movable toward and away from each other, while turning the filter and the wet sheet-like intermediate sample upside down onto the lower hot plate of the drying station, and subsequently removing the wet sheet-like intermediate sample from the filter; and

(d) thereafter, drying the wet sheet-like intermediate sample with heat and pressure in the drying station, thereby forming a dry sheet-like final sample.

5,069,754

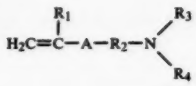
PAPERMAKING METHOD

Naotaka Watanabe, Tokyo; Takeo Arai, Yokohama; Hitoshi Fujiyoshi, Yokohama, and Masako Shirota, Yokohama, all of Japan, assignors to Mitsui-Cyanamid, Ltd., Tokyo, Japan

Filed Feb. 16, 1990, Ser. No. 481,051
Claims priority, application Japan, Feb. 27, 1989, 1-43094
Int. Cl.[5] D21H 17/44
U.S. Cl. 162—168.2 5 Claims

1. In a method of preparing a paper having a reinforced strength wherein a polymer latex is added to a paper stock in an amount of from 2.5 to 30% by weight, the improvement wherein the polymer latex is prepared by neutralizing a seed polymer emulsion with an acid or a salt or by quaternizing it with a quaternizing agent, the surfaces of the emulsion seed

thereby being provided with a large number of cationic groups, and where the seed polymer emulsion is formed by adding a monomer represented by the following formula (I) or a mixture of the monomer (I) and copolymerizable ethylenic unsaturated monomer(s) (II) to a seed latex of a carboxyl-modified synthetic rubber latex or a carboxylated synthetic resin emulsion and polymerizing them:



(I)

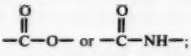
in which

R_1 represents H or CH_3;

R_2 represents an alkylene group having from 2 to 5 carbon atoms;

R_3 and R_4 each represent H or an alkyl group having from 1 to 5 carbon atoms;

A represents



and

R_1, R_3 and R_4 are so selected that the monomer is substantially insoluble in water,

the proportion of monomer I to the seed latex being at least 5% weight.

5,069,755

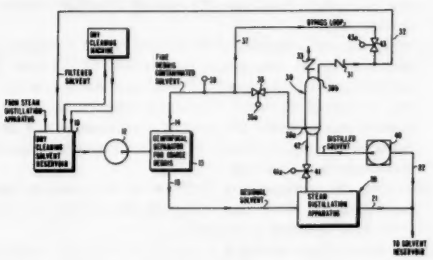
DRY CLEANING SOLVENT FILTRATION AND STEAM DISTILLATION RECOVERY SYSTEM

Larry L. Durr, 9102 Grinnell, Indianapolis, Ind. 46268; B. Jan Clay, 7650 Eagle Valley Pass, Indianapolis, Ind. 46224, and Larry J. Durr, 5210 Kathcart Way, Indianapolis, Ind. 46254

Division of Ser. No. 273,261, Nov. 18, 1988, Pat. No. 4,954,222. This application Apr. 20, 1990, Ser. No. 512,165

Int. Cl.[5] B01D *3/38, 27/00;* **D06F** *43/08*

U.S. Cl. 202—169 **3 Claims**



1. A combination comprising:

a dry cleaning machine using an essentially water immiscible dry cleaning solvent fluid and having an outlet for contaminated solvent and an inlet for solvent having its contamination reduced;

mechanical filtration means coupled to said dry cleaning machine for filtering contaminated solvent fluid obtained from the outlet of said dry cleaning means; and

a steam distillation apparatus coupled to said dry cleaning machine for distilling contaminated solvent obtained from the outlet of said dry cleaning means, said steam distillation apparatus including:

an evaporator for evaporating the solvent fluid by admixture of live steam with contaminated solvent obtained from said outlet to produce an azeotropic vapor mixture;

a condenser for receiving the vapor mixture from said evaporator and for condensing the vapor mixture to a mixture of water and solvent fluid;

a coalescer separator for separating the water from the solvent fluid and having a distilled solvent outlet and a water outlet, and

means providing a path for solvent coming from said distilled solvent outlet to reach the inlet of said dry cleaning machine.

5,069,756

SEPARATION OF CYCLOHEXANE FROM CYCLOHEXENE BY AZEOTROPIC OR EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., Bozeman, Mont. 59715, assignor to Lloyd Berg, Bozeman, Mont.

Filed Nov. 26, 1990, Ser. No. 618,304

Int. Cl.[5] B01D *3/36, 3/40;* **C07C** *7/00*

U.S. Cl. 203—51 **2 Claims**

1. A method for recovering cyclohexane from a mixture of cyclohexane and cyclohexene which comprises distilling a mixture of cyclohexane and cyclohexene in the presence of an azeotrope forming agent, recovering the cyclohexane and the azeotrope forming agent as overhead product and obtaining the cyclohexene from the still pot, wherein said azeotrope forming agent comprises one material selected from the group consisting of ethanol, n-propanol, n-butanol and ethylene glycol methyl ether.

5,069,757

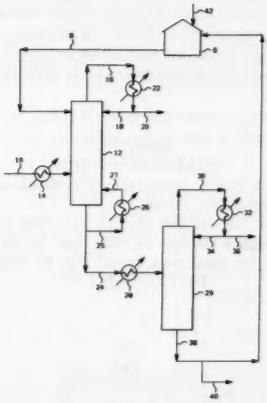
SEPARATION OF AROMATICS FROM ALKANES

Ronald E. Brown, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 2, 1990, Ser. No. 547,553

Int. Cl.[5] B01D *3/40*

U.S. Cl. 203—51 **9 Claims**



1. In a process for separating at least one aromatic hydrocarbon containing 6–10 carbon atoms per molecule from at least one close-boiling alkane by extractive distillation of a feed consisting essentially of said at least one aromatic hydrocarbon and said at least one alkane, the improvement which comprises employing a solvent consisting essentially of a mixture of (a) N-(β-mercaptoethyl)-2-pyrrolidone and (b) cyclotetramethylene sulfone; wherein said extractive distillation process produces (i) an overhead distillate product which contains a smaller volume percentage of said at least one aromatic hydrocarbon and a larger volume percentage of said at least one alkane than said feed, and (ii) a bottoms product which contains said solvent and a larger volume percentage of said at

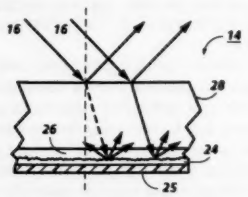
least one aromatic hydrocarbon and a smaller volume percentage of said at least one alkane than said feed; and wherein said at least one aromatic hydrocarbon is separated from said solvent and recovered from said bottoms product.

5,069,758

PROCESS FOR SUPPRESSING THE PLYWOOD EFFECT IN PHOTOSENSITIVE IMAGING MEMBERS

William G. Herbert, Williamson; John R. Andrews, Fairport, and Clifford H. Griffiths, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 28, 1991, Ser. No. 646,117
Int. Cl.[5] C25D *1/02*
U.S. Cl. 205—73 **6 Claims**



1. A process for forming a photosensitive imaging member having at least a conductive ground plane with overlying charge transport and charge generator layers comprising the steps of

forming a conductive ground plane by maintaining a continuous and stable acqueous nickel sulphamate electroforming solution adapted to form a relatively thin, ductile, seamless nickel belt having a matte-like finish, the surface of said belt having a dull appearance and a surface roughness range of 0.5 to 20.0μ inch RMS,

electrolytically depositing nickel from said solution onto a support mandrel, cooling said nickel-coated mandrel effecting a parting of the nickel belt from the mandrel due to different respective coefficients of thermal expansion,

overlying said nickel belt with a charge generator layer and

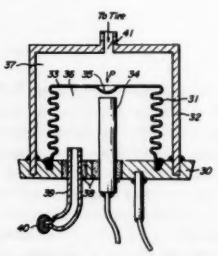
overlying said charge generating layer with a charge transport layer.

5,069,759

PRESSURE SWITCH

Masato Hodate, Tokyo, Japan, assignor to Bridgestone Corporation, Higashiyamato, Japan

Division of Ser. No. 451,059, Dec. 15, 1989, Pat. No. 5,028,749.
This application Apr. 26, 1991, Ser. No. 691,882
Claims priority, application Japan, Dec. 17, 1988, 63-317611
Int. Cl.[5] C25D *1/02*
U.S. Cl. 205—73 **7 Claims**



1. A method of manufacturing a bellofram comprising a metal cylindrical bellows and a metal diaphragm, said method comprising:

providing a metal having a relatively low melting point;

subjecting said provided metal to a molding process to form a mold having desired dimensions and a desired shape;

plating a gold layer onto said formed mold;

applying a metal layer on said plated gold layer, said applied metal layer having a relatively high melting point, corrosion resistance and a high elastic modulus; and

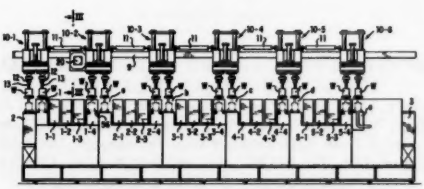
dissolving said mold.

5,069,760

APPARATUS AND METHOD FOR SURFACE TREATMENT OF WORKPIECES

Hirokazu Tsukamoto, and Seishi Watanabe, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Shizuoka, Japan

Filed Jun. 22, 1990, Ser. No. 542,094
Claims priority, application Japan, Jun. 30, 1989, 1-167137
Int. Cl.[5] C25D *7/04, 17/28;* **B05C** *3/00*
U.S. Cl. 205—80 **22 Claims**



19. A process for chemically treating surfaces of workpieces comprising:

moving workpieces sequentially and longitudinally along a row of equally longitudinally spaced chemical treating workstations;

interrupting the longitudinal movement of the workpieces and moving the workpieces transversely of the row of workstations for additional chemical processing at at least one additional chemical treatment workstation located transversely adjacent the row of workstations and disposed at an equal increment of distance between adjacent workstations in said row;

returning the workpiece to the row of workstations and continuing to move the workpiece along the row for continued chemical treatment;

each workstation arranged to carry out a single step in multi-step chemical treatment process for the workpiece surfaces; and said additional processing including using processing apparatus that elongates said at least one chemical treating workstation to a total length greater than the length of at least the next lengthwise adjacent workstation in said row.

22. A process for chemically treating surfaces of workpieces as claimed in claim **19**, wherein the chemical treatment carried out at said at least one additional chemical treatment workstations is an electroplating process using liquid electroplating solution conveyed by an electrically conductive electroplating solution supply conduit, including the step of electrically charging the conduit during the electrolytic plating process and using the conduit as an electrode to transmit electrical energy to the electroplating solution during the electroplating process.

5,069,761

METHOD FOR PRETREATING THE CONNECTING ELEMENTS OF A GAS-TIGHT PIPE CONNECTION

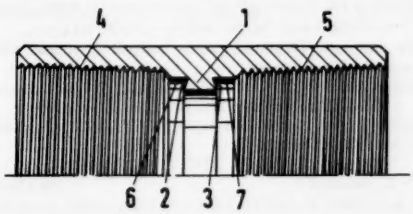
Reiner Krings, Düsseldorf, and Willy Schulte, Langenfeld, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Apr. 16, 1990, Ser. No. 509,735

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1989, 3913314

Int. Cl.[5] C25D *7/04*; B05D *7/22*; F16L *9/14*

U.S. Cl. 205—183 10 Claims



1. A method for pretreating the connecting elements of a gas-tight pipe connection of the type including an internally threaded coupling for being screwed to externally threaded spigots at pipe ends to be joined, a metallic sealing seat, and an abutment shoulder, the method comprising the steps of:

a. surface cleaning the threaded and sealing regions of the connecting elements;

b. providing only the coupling on its inner side with a covering while leaving the spigots bare; and

c. before screwing together the connecting elements, applying oil as a lubricant to the covered coupling and bare spigots.

5,069,762

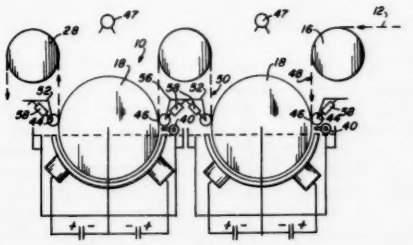
APPARTAUS FOR IMPROVED CURRENT TRANSFER IN RADIAL CELL ELECTROPLATING

Thomas A. Modrowski, Wayne County, Mich.; Larry E. Pfister, Allegheny County, Pa.; Gregory A. Raybuck, and James O. Stoddart, both of Wayne County, Mich., assignors to USX Corporation, Pittsburgh, Pa.

Filed Jan. 18, 1991, Ser. No. 644,065

Int. Cl.[5] C25D *17/06, 17/00*

U.S. Cl. 205—137 27 Claims



1. An improved radial-type electrodeposition apparatus for plating metal onto one side of a metallic strip, the apparatus comprising a reservoir for retaining a bath of plating electrolyte, a radial cathode partially submerged in the electrolyte bath, the cathode having a central conductor band of a width less than the strip width and non-conducting pliable edges, anodes arranged about the submerged portion of the radial cathode, and deflector rolls located above the electrolyte bath and cooperating with the radial cathode to exert a tensile force on the portion of strip between the deflector rolls, the tensile force urging the metallic strip against the conductor band of the radial cathode with a force normal to the strip surface and the conductor band surface, wherein the improvement comprises means for improving current transfer between the strip and the conductor band, said means contacting the strip proximate the tangent point of the strip with the radial cathode and imparting a contact force normal to the strip surface to urge the strip uniformly against the conducting band of the radial cathode, the contact force permitting a reduction in the amount of tensile force required for uniform current transfer between the strip and the conducting band.

5,069,763

METHOD OF COATING ALUMINUM WITH VANADIUM OXIDES

Rudolf Hradcovsky, 27 W. Beech St., Long Beach, N.Y. 11561

Filed Jan. 2, 1990, Ser. No. 459,552

Int. Cl.[5] C25D *11/02, 11/06*

U.S. Cl. 205—326 12 Claims

1. A method of coating a rectifier metal selected from the group consisting of aluminum, tantalum, niobium, and alloys thereof, and alloys of aluminum with copper or zinc, to produce hard, uniform, adherent and corrosion-resistant layer predominating in vanadium oxides, said method comprising:

(a) immersing said rectifier metal in an aqueous electrolytic bath comprising a major amount of alkali metal orthovanadate and a minor amount of alkali metal silicate, exclusive of water,

(b) immersing another metal which is cathodic with respect to said rectifier metal in said electrolytic bath when a voltage potential is applied between said metals, and

(c) imposing a voltage potential between said rectifier metal and said cathodic metal and raising said voltage potential to about 280 volts within about 25 to about 35 seconds, and thereafter raising said voltage potential further therefrom to between about 280 to about 360 volts until the desired coating thickness is deposited on the rectifier metal.

5,069,764

CARBON ELECTRODE HAVING LOW POLARIZABILITY

Nobuatsu Watanabe, 136, Uguisudai, Nagaokakyou-shi, Kyoto; Tetsuro Tojo; Yong-bo Chong, both of Kyoto, and Kenji Ikari, Saga, all of Japan, assignors to Nobuatsu Watanabe, Kyoto, Japan

Filed Aug. 4, 1989, Ser. No. 389,644

Claims priority, application Japan, Aug. 5, 1988, 63-194373

Int. Cl.[5] C25B *1/24, 11/06*

U.S. Cl. 204—60 5 Claims

3. A method for producing fluorine, which comprises electrolyzing an electrolyte comprising a mixed molten salt system of potassium fluoride and hydrogen fluoride in an electrolytic cell having a carbon anode,

said carbon anode being a preformed carbon electrode comprising a porous carbon block and, contained in the pores of said porous carbon block, a metal fluoride mixture consisting essentially of LiF and a metal fluoride other than LiF,

said carbon anode suppressing an abrupt spontaneous rise of voltage and decrease of current during the electrolysis known as the anode effect.

5,069,765

METHOD OF MANUFACTURING COMBUSTIBLE GASEOUS PRODUCTS

Arlin C. Lewis, P.O. Box AU, Libby, Mont. 59923

Continuation of Ser. No. 198,741, May 25, 1988, abandoned. This application Apr. 11, 1990, Ser. No. 508,488

Int. Cl.[5] C01B *31/00*

U.S. Cl. 204—173 7 Claims

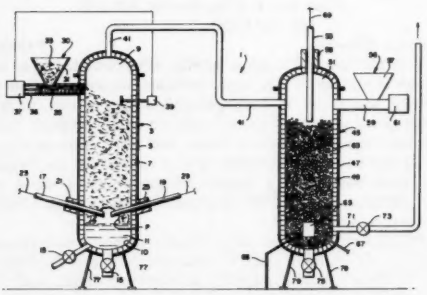
1. A method of manufacturing combustible gaseous products from carbonaceous materials comprising the steps of:

a) providing a primary reaction chamber and maintaining a

first electric arc zone at the bottom of the primary chamber, and providing a secondary reaction chamber containing an incandescent coke bed, each chamber being of a vertical configuration;

b) charging carbonaceous material into the top of the primary chamber and maintaining a substantially constant volume level of material above the first electric arc zone therein;

c) continuously moving the carbonaceous material downwardly through the primary chamber and into contact with the electric arc zone to electrothermally and photochemically activate the gasification of the material and produce a raw product gas therefrom;



d) passing the raw product gas upwardly through the downwardly moving carbonaceous material in countercurrent heat exchange therewith to initiate pyrolysis of the incoming material and produce a condensable product and a noncondensable product;

e) removing the raw product gas and noncondensable product from the top of the primary chamber and introducing same into the secondary chamber;

f) refluxing the condensable product with the downwardly moving carbonaceous material toward the bottom of the primary chamber, and

g) passing the raw product gas and noncondensable product through the incandescent coke bed in the second chamber to produce a refined product gas comprised mainly of hydrogen and carbon monoxide.

5,069,766

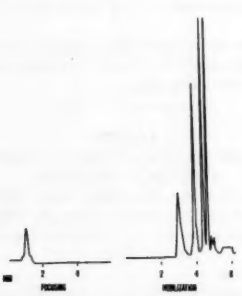
SUPPRESSION OF ELECTROENDOSMOSIS IN CAPILLARY ELECTROPHORESIS

Ming-De Zhu, Berkeley; Roberto Rodriguez, Richmond, and C. Timothy Wehr, Albany, all of Calif., assignors to Bio-Rad Laboratories, Inc., Hercules, Calif.

Filed Dec. 20, 1990, Ser. No. 631,804

Int. Cl.[5] B01D *57/02, 61/42*

U.S. Cl. 204—180.1 **27 Claims**



1. A method for suppressing electroendosmosis during the electrophoretic separation of a liquid sample mixture into components in a capillary of a material susceptible to the formation of an electrokinetic potential, said capillary positioned in an electric current path between two electrolyte solutions containing a catholyte and anolyte, respectively, said method comprising incorporating an additive selected from the group consisting of a water-soluble polymer, a hydrophilic gel, and a combination thereof into one or both of said electrolyte solutions, in sufficient quantity to resist bulk flow through the end of said capillary opening therein.

5,069,767

METHOD OF ELECTRODEPOSITION COATING, AND WATER-BASE PAINT RESIN COMPOSITION

Akira Tominaga, Chigasaki, Japan, assignor to Kansai Paint Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 135,305, Dec. 21, 1987, abandoned. This application Nov. 22, 1989, Ser. No. 439,000

Claims priority, application Japan, Dec. 23, 1986, 61-305457; Dec. 23, 1986, 61-305458

Int. Cl.[5] C25D *13/04*

U.S. Cl. 204—181.7 **14 Claims**

1. A method of electrodeposition coating which comprises electrodepositing a water-base electrodeposition coating composition comprising a cationic group-containing resin as a film-forming vehicle and acetylacetone on an article to be coated and then heating the coated article to form a cured coated film, wherein the cationic group-containing resin contains a functional group selected from the group consisting of hydroxysilane and alkoxysilane groups, and can be crosslinked by the condensation reaction of the functional group, the base resin for the cationic group-containing resin being a resin containing hydroxyl group in an amount of 0.2 to 10 milliequivalents/gram of dry resin.

5,069,768

PROCESS FOR SEPARATING SUBSTANCES PRESENT IN LIQUIDS

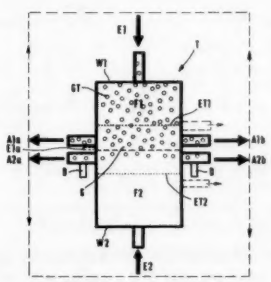
Andreas Plaas-Link, Langensalzerstr. 5, D-3000 Hannover, Fed. Rep. of Germany

Continuation of Ser. No. 347,583, May 5, 1989, abandoned. This application Jan. 3, 1991, Ser. No. 636,005

Claims priority, application Fed. Rep. of Germany, May 5, 1988, 3815296

Int. Cl.[5] B01D *57/02;* **C25B** *7/00*

U.S. Cl. 204—180.1 **8 Claims**



1. A process for separating substances present in liquids, comprising the steps of:

a) providing a reaction vessel having a first surface and a second surface spaced from said first surface,

b) providing in each of the surfaces an intake opening for facilitating liquid flow into said vessel at substantially oppositely directed flow paths,

c) introducing a first liquid containing a soluble substance into one of said intake openings,

d) introducing a second liquid into the other of said intake openings,

e) forming a boundary layer spaced from said intake openings and forming an interface of the first liquid and the second liquid inside said vessel where contact between the first liquid and the second liquid occurs and forming a stable flow of the first liquid and the second liquid from the intake openings to outlet openings on each side of the boundary layer, and

f) applying an electrical charge across the boundary layer which causes the soluble substance to be removed from the first liquid to the second liquid without mixing of the first liquid with the second liquid.

5,069,769

ELECTROPHORESIS PATTERN READING SYSTEM OF FLUORESCENCE TYPE

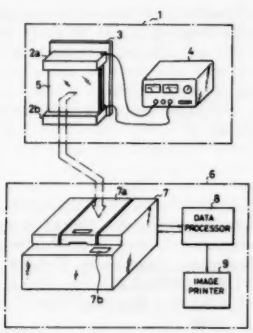
Hitoshi Fujimiya; Shigeo Nakajima, and Hisanori Nasu, all of Yokohama, Japan, assignors to Hitachi Software Engineering Co., Ltd., Yokohama, Japan

Filed Jun. 6, 1990, Ser. No. 533,853

Claims priority, application Japan, Jun. 7, 1989, 1-145859

Int. Cl.[5] C25B *1/00, 7/00;* **B01D** *61/42;* **C25D** *13/00*

U.S. Cl. 204—182.8 **24 Claims**



1. An electrophoresis pattern reading system of fluorescence-detection type, useful for analyzing a gel-based sample, the sample being labeled with a fluorescent substance that fluoresces upon application of light thereto, comprising:

a detachable migration unit comprising a gel functioning as a base for a sample to be analyzed by electrophoresis and a gel-supporting body for supporting the gel;

an electrophoresis unit, to which the migration unit is detachably mounted, for performing electrophoresis by applying migrating voltage to the gel to which the sample labeled with a fluorescent substance is added; and

a reading unit physically separate from the electrophoresis unit for reading an electrophoresis pattern, the reading unit including means for detachably mounting the migration unit detached from and apart from the electrophoresis unit after electrophoresis, and said reading unit having means for passing light to the detachably mounted migration unit and for receiving fluorescence emitted from the fluorescent substance of the sample on the gel upon application of the light.

5,069,770

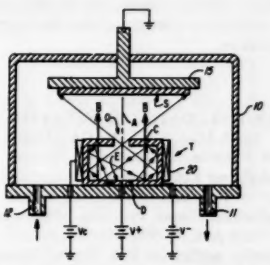
SPUTTERING PROCESS EMPLOYING AN ENCLOSED SPUTTERING TARGET

David A. Glocker, Henrietta, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 23, 1990, Ser. No. 556,135

Int. Cl.[5] C23C *14/34, 14/35*

U.S. Cl. 204—192.12 **5 Claims**



1. A sputtering process for depositing a thin-film of material on a workpiece, said process comprising the steps of:

(a) providing a sputtering target having electrically conductive walls which define a substantially enclosed sputtering chamber, one of said walls having at least one relatively small orifice therein, said orifice having a cross-sectional area which is at least ten times smaller than the largest cross-sectional area of the sputtering chamber;

(b) supporting a workpiece in a position confronting said orifice;

(c) connecting said target to a reference voltage efficient to produce a sputtering plasma within said sputtering chamber to sputter particles from the chamber-defining walls of the target, a portion of such particles exiting said chamber through said orifice and depositing on the workpiece;

(d) producing a magnetic field within said chamber in a direction substantially parallel to a line between the target and the workpiece; and

(e) providing an electrode within said target and connecting said electrode to a voltage which is positive with respect to said reference voltage.

5,069,771

MOLTEN SALT ELECTROLYSIS WITH NON-CONSUMABLE ANODE

Thinh Nguyen, Onex; Adbelkrim Lazouni, Geneva, and Kim S. Doan, Onex, all of Switzerland, assignors to Moltech Invent S.A., Luxembourg

PCT No. PCT/EP88/00788, § 371 Date Apr. 28, 1989, § 102(e) Date Apr. 28, 1989, PCT Pub. No. WO89/01994, PCT Pub. Date Mar. 9, 1989

PCT Filed Aug. 30, 1988, Ser. No. 350,475

Claims priority, application Austria, Sep. 2, 1987, 87810503

Int. Cl.[5] C25B *11/04, 11/00;* **C25C** *3/06*

U.S. Cl. 204—292 **13 Claims**

1. A method of electrowinning a metal by electrolysis of a fluoride-based melt containing a dissolved oxide of the metal to be won using an anode immersed in the melt wherein the anode has a metal, alloy or cermet substrate and an operative anode surface which is a protective surface coating containing a fluorine-containing cerium oxycompound, the protective coating being preserved by maintaining in the melt a suitable concentration of at least one cerium compound, characterized by using an using an anode comprising:

(a) an electronically conductive oxygen barrier layer on the surface of the metal, alloy or cermet substrate,

wherein the oxygen barrier layer is selected from the group consisting of a chromium oxide containing layer; a layer containing at least one of platinum, palladium

and gold; platinum-zirconium alloys; and nickel-aluminum alloys,

and wherein the anode further comprises:

(b) a pre-applied oxide ceramic layer between the protective coating and the oxygen barrier layer, said oxide ceramic layer serving as anchorage for the protective coating,

wherein the oxide ceramic layer is selected from the group consisting of copper oxide in solid solution with at least one further oxide; nickel ferrite; copper oxide and nickel ferrite; doped, non-stoichiometric or partially substituted spinels; and rare earth metal oxides or oxyfluorides.

5,069,772

APPARATUS FOR COATING SUBSTRATES BY MEANS OF A MAGNETRON CATHODE

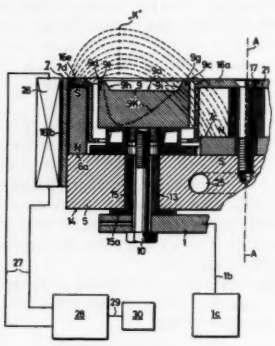
Wolf-Eckhart Fritsche, Kleinostheim; Michael Lübbehusen, Bruchkobel; Reiner Kukla, Hanau, and Siegfried BeiBwenger, Alzenau, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Filed Aug. 8, 1990, Ser. No. 564,363

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1990, 4018914

Int. Cl.[5] **C23C** *14/34*

U.S. Cl. 204—298.12 **12 Claims**



1. Apparatus for coating substrates by means of cathode sputtering by use of a magnetron cathode with an annularly closed target which has a sputtering surface, an inner edge and an outer edge and a magnet system including permanent magnets having an outer annularly closed pole which is geometrically similar to the target disposed outside the outer edge and an inner annularly closed pole which is also geometrically similar to the target disposed inside the inner edge so that at least the greater part of the magnetic flux lines is guided over the sputtering surface on only slightly arcuate paths and so that an annular magnetic tunnel of flux lines is formed which is closed over the sputtering surface and wherein the magnet system is at a self-adjusting electrical potential with respect to the ground potential as well as the cathode potential, wherein

a. said permanent magnets are disposed so that the one area of the magnetic tunnel where the flux lines run approximately parallel to the sputtering surface, as they are present in the original state of the target, is closer to the outer edge of the target than to the inner edge, whereby an annular zone of maximum target erosion is closer to the outer target edge than the inner edge in absence of additional magnetic fields,

b. an annularly closed magnetic coil bearing a geometric resemblance to the outer pole and is provided surrounding the outer pole, and

c. a power supply is provided for said magnetic coil, said power supply having means for providing said coil with an excitation current with an averaged time value distinct from zero, whereby

d. an additional magnetic field which varies over time can be superposed over the field of the permanent magnets and the zone of maximum target erosion can be periodically shifted from the center towards both edges by a periodic change of the excitation current.

5,069,773

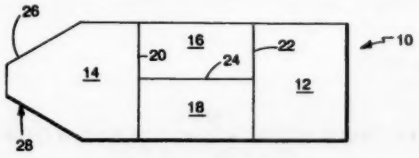
ELECTROPHORETIC GEL FORMING SYSTEM

John V. Frangioni, 128 Rawson Rd., Arlington, Mass. 02174

Filed Feb. 6, 1991, Ser. No. 651,204

Int. Cl.[5] **B01D** *61/42;* **C25D** *13/00*

U.S. Cl. 204—299 R **23 Claims**



1. Apparatus for forming an electrophoretic gel comprising a polymer, said apparatus comprising:

at least two sealed compartments, one said sealed compartment having a first inner volume, a second said sealed compartment having a second inner volume, said first and second inner volumes being separated from each other by at least one burstable seal, one said inner volume comprising a monomer which can be polymerized to form said polymer, the other said inner volume comprising a catalyst, wherein bursting of said burstable seal allows said monomer and said catalyst to contact each other and, in conjunction with any other necessary components held within said apparatus, to form a liquid medium in said apparatus, said liquid medium being adapted to form the electrophoretic gel.

5,069,774

SURFACE MOUNTING CORROSION PROBE

Karel Hladky, and David G. John, both of Manchester, United Kingdom, assignors to University of Manchester Institute of Science & Technology, Manchester, England

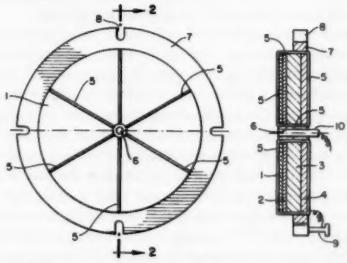
PCT No. PCT/GB88/00753, § 371 Date May 21, 1990, § 102(e) Date May 21, 1990, PCT Pub. No. WO89/02589, PCT Pub. Date Mar. 23, 1989

PCT Filed Sep. 16, 1988, Ser. No. 469,535

Claims priority, application United Kingdom, Sep. 19, 1987, 87-22088

Int. Cl.[5] **G01N** *17/04*

U.S. Cl. 204—404 **7 Claims**



1. A surface mounting corrosion probe comprising a frame

adapted for securing to a surface of a reinforced concrete structure, and a resilient pad arranged such that when the frame is secured to such a structure one surface of the pad is pressed against the structure surface, wherein a reference electrode is locatable centrally relative to the said one surface so as to contact the surface of any structure against which the pad is pressed, at least an annular portion of the said one surface extending radially outwards from the center towards adjacent the periphery of the pad is electrically conductive, and a terminal is provided which is electrically connected to the said annular portion, whereby corrosion monitoring instruments can be connected to the said terminal and the said reference electrode to monitor corrosion of reinforcement beneath the surface of a structure to which the frame is secured.

5,069,775

HEAVY CRUDE UPGRADING USING REMOTE NATURAL GAS

Martin P. Grosboll, Kingwood, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 7, 1990, Ser. No. 519,638
Int. Cl.[5] C10G *47/00, 47/02*
U.S. Cl. 208—108 **8 Claims**

1. A method of forming an upgraded crude with a plurality of steps which consist essentially of

a. forming hydrogen from methane gas for hydroconverting heavy crude to form a better crude and reduce its viscosity;

b. hydrogenating under hydroconverting conditions of 650 degrees Fahrenheit (°F)–1000° F.; and 500–3000 pounds per square inch guage (psig) only a first portion of a crude oil stream less than the total crude oil stream to produce a light oil that has a lowered viscosity;

c. admixing said light oil with the remainder of the crude oil stream not hydrogenated to produce a flowable crude; and

d. transporting the flowable crude to a refinery including a substep of flowing the crude through a pipeline.

5,069,776

PROCESS FOR THE CONVERSION OF A HYDROCARBONACEOUS FEEDSTOCK

Jaydeep Biswas; Ian E. Maxwell, and Johan M. Van Der Eijk, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 21, 1990, Ser. No. 482,613
Claims priority, application United Kingdom, Feb. 27, 1989, 8904409
The portion of the term of this patent subsequent to Dec. 12, 2006, has been disclaimed.
Int. Cl.[5] C10G *11/18*
U.S. Cl. 208—120 **9 Claims**

1. A process for the conversion of a hydrocarbonaceous feedstock having an end boiling point of at most 330° C, which process comprises contacting the feedstock with a moving bed of a zeolitic catalyst essentially consisting of a binder material and a zeolite which zeolite has a pore diameter of 0.3 to 0.7 nm at a temperature from 500° C. to 900° C. during less than 10 seconds and at a catalyst/feedstock weight ratio of 20 to 150:1, wherein a product is formed which is enriched in olefins.

5,069,777

PROCEDURE FOR THE FIXED-BED SWEETENING OF PETROLEUM FRACTIONS

Jean-Michel Orgebin, Saint-Adresse; Claude Marty, Le Havre; Patrick Ansquer, Lillebonne, and Pierre Maroy, Versailles, all of France, assignors to Compagnie de Raffinage et de Distribution Total France, Levallois-Perret, France

Filed Sep. 10, 1990, Ser. No. 579,820
Claims priority, application France, Sep. 8, 1990, 89 11781
Int. Cl.[5] C10G *27/10, 29/00*
U.S. Cl. 208—207 **30 Claims**

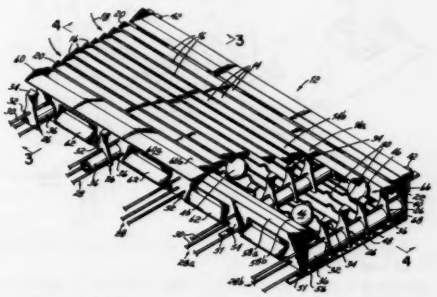
1. A process for sweetening a petroleum fraction by catalytic oxidation of mercaptans contained therein, comprising contacting said fraction with an oxidizing agent in the presence of a fixed bed of a catalyst formed of a support impregnated with a metal chelate and in the absence of any aqueous base, maintaining the water content of the support within a range of values within which the catalyst remains effective to convert mercaptans to disulfide by manipulating the net effective water solvency power of the feedstock and regulating the temperature of the feedstock to be sufficiently high to solubilize the water of reaction resulting from the conversion of the mercaptans to disulfides.

5,069,778

SCREEN DECK WITH PEDESTAL MOUNTED SLATS

William E. Lower, Cincinnati, and Stephen C. Mitchell, West Chester, both of Ohio, assignors to Rotex, Inc., Cincinnati, Ohio

Filed Nov. 13, 1990, Ser. No. 611,835
Int. Cl.[5] B07B *1/28*
U.S. Cl. 209—323 **16 Claims**



1. A screen deck comprising,

frame members,

a series of spaced, canted parallel slats, and

slat support means mounting and positioning said slats so that slots are presented between the slats, said support means comprising,

a plurality of sets of parallel rods extending between said frame members, transversely to said slats,

a plurality of pedestals aligned by and carried on the rods of each set, said slats being mounted by the respective pedestals,

each pedestal having a back presenting at least two alignment apertures through which pass the rods of the respective set,

the pedestals on each set of rods being spaced from each other along said rods by spacers between the backs of the pedestals,

the spacers positioning said pedestals perpendicularly to the rods and in rows transverse to the rod sets, and

means clamping the pedestals and spacers in such positions relative to said frame members.

5,069,779

WATER TREATMENT SYSTEM

Keith E. Brown, Solon, and Lyle E. Kirman, Cleveland Heights, both of Ohio, assignors to Kinetico, Incorporated, Newbury, Ohio

Filed Dec. 15, 1989, Ser. No. 451,094
Int. Cl.[5] C02F *1/42*
U.S. Cl. 210—87 **26 Claims**

1. A water treatment apparatus, comprising:

a) at least three treatment tanks, each tank being provided with means defining a first port and second port and

containing a treatment material defining a fluid flow path between said first and second ports;

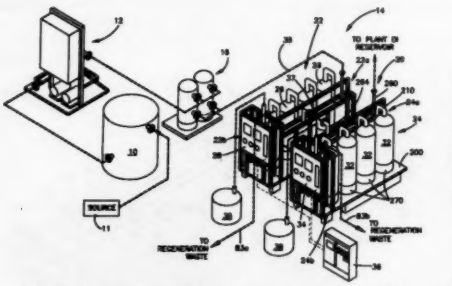
b) a first valve means in fluid communication with said first port of each tank and a second valve means in fluid communication with said second port of each treatment tank;

c) a source fluid manifold for delivering fluid to be treated to said tanks, said source manifold in fluid communication with each of said first valve means;

d) a treated fluid receiving manifold for receiving treated fluid from said treatment tanks, said treated fluid receiving manifold in fluid communication with each of said second valve means;

e) a regeneration chemical supply manifold for delivering a regeneration chemical to a treatment tank requiring regeneration, said regeneration supply manifold in fluid communication with each of said second valve means;

f) a regeneration chemical discharge manifold for receiving regeneration related fluids from said tanks, said regeneration discharge manifold in fluid communication with each of said first valve means;



g) said first valve means of each tank operative to selectively communicated either said source manifold or said regeneration chemical discharge manifold with said first port of its associated tank;

h) said second valve means of each tank operative to selectively communicate either said treated fluid receiving manifold or said regeneration chemical supply manifold with its associated second port;

i) regeneration control means for controlling a regeneration cycle for an exhausted tank including means for monitoring the exhaustion level for each of said of tanks and operative to initiate regeneration upon determining that a tank has reached a predetermined exhaustion level or upon determining that a second tank will reach said predetermined exhaustion level unless said first tank is regenerated immediately.

5,069,780

ULTRAFILTRATION DEVICE AND PROCESS

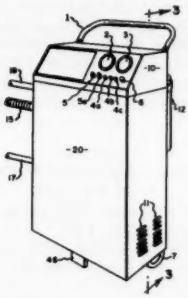
William H. Thalmann, East Amherst, and Thomas W. Siegler, Kenmore, both of N.Y., assignors to Infinitex, Clarence, N.Y.

Continuation-in-part of Ser. No. 533,030, Jun. 4, 1990, Pat. No. 4,994,184. This application Dec. 17, 1990, Ser. No. 628,224

Int. Cl.[5] B01D *61/18, 61/22*

U.S. Cl. 210—90 **30 Claims**

1. A portable ultrafiltration assembly comprising: a prefilter sufficient to filter particles, having a size greater than about 100 microns, from an influent liquid feed stream comprising greater than about 50 percent by weight water; pump means, sufficient to pump an influent liquid feed from a reservoir source into said assembly through said prefilter; temperature sensor means, sufficient to detect temperature variations of said liquid feed being processed in said assembly; pressure sensor means, sufficient to detect pressure variation of said liquid feed being processed in said assembly; means for dissipating heat generated during processing from said assembly; means cooperating with a temperature sensor to interdict the operation of said pump means; means to transport liquid feed from said pump means to a membrane filter assembly; membrane filter assembly comprising an influent feed treatment zone containing a liquid feed inlet and outlet, and a water receiving zone containing a water outlet, said zones being separated by a hydrophilic



ultrafiltration membrane through which water can pass from said influent feed treatment zone to said water receiving zone; means cooperating with a pressure sensor to interdict the operation of the pump means; and, orifice means cooperating with said pump means sufficient to maintain a liquid feed pressure of from about 45 to about 100 lbs/in^2 at said membrane and a Δp, along said membrane, of less than about 4 lbs/in^2.

5,069,781

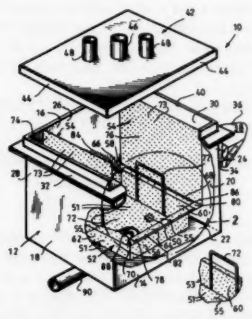
COMBINED FLOOR SINK AND STRAINER

Gene W. Wilkes, 20910 Peachtree Rd., Dickerson, Md. 20842

Filed May 10, 1990, Ser. No. 521,407

Int. Cl.[5] F03C *1/26*

U.S. Cl. 210—164 **10 Claims**



1. A floor sink for use in a floor comprising: a hollow floor sink housing having a bottom and side walls, at least one liquid inlet and a liquid outlet located to provide for the entrance of liquid into and the exit of liquid out of said hollow floor sink housing; strainer means for straining solid particles from liquid passing through said floor sink comprising a strainer basket; and strainer basket locating and holding means located within said hollow floor sink housing for locating and holding said strainer basket within said hollow floor sink housing, said strainer basket locating and holding means for locating and holding said strainer basket comprising means for locating said strainer basket away from the bottom and side walls of said hollow floor sink housing and further comprising means for forming a barrier to the passage of solid particles and for permitting passage of liquid positioned within said hollow floor sink housing to prevent incoming liquid coming through said

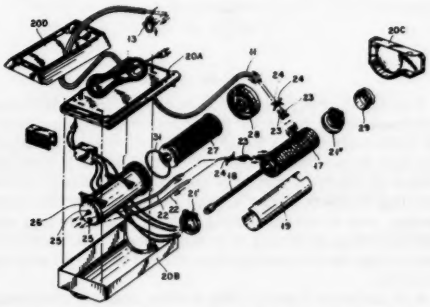
inlet from going around said means for forming a barrier to the passage of solid particles and for permitting passage of liquid and said strainer basket when said strainer basket is located in place within said hollow floor sink housing by said strainer basket locating and holding means.

5,069,782

FLUID PURIFICATION SYSTEMS

George C. Moyher, Jr., Bluff City, Tenn.; Randy Jamerson, Bristol, Va.; David Nessim, Bristol, Tenn.; Jeffrey Kapec, Westport; Kazuna Tanaka, Cos Cob, both of Conn., and Allan Chochinov, Brooklyn, N.Y., assignors to Electrolux Water Systems, Inc., Marietta, Ga.

Filed Apr. 26, 1990, Ser. No. 514,603
Int. Cl.[5] B01D *36/00;* **C02F** *1/32*
U.S. Cl. 210—192 **6 Claims**



6. In a water purification system having a longitudinal tube for the supply of ultraviolet energy, a pair of helical ultraviolet energy-transparent plastic coils surrounding the tube, and a longitudinal filter, wherein water is exposed to ultraviolet energy before and after flowing through the filter, the improvement comprising:

a unitary housing having a mounting or support surface for mounting said housing to the undersurface of an above-counter kitchen cabinet or the backsplash of a kitchen sink, or supporting said housing on the kitchen countertop;

said filter, ultraviolet tube and helical coils being arranged within said unitary housing, and wherein all the electrical wires for providing power to said ultraviolet tube are brought to one end of said tube;

said filter being disposed directly adjacent to the arrangement of said coils and said ultraviolet tube with the longitudinal axis of said filter parallel to the longitudinal axis of said tube;

a closed reflecting ultraviolet chamber surrounding the assembly of ultraviolet tube and helical coils;

a water supply tube coupling the unfiltered water to one of the helical coils at a connection point and a water return tube coupling the filtered water from the other of said coils to a kitchen sink faucet at another connection point;

nipple connecting elements utilized at each connection point, said elements having a barbed portion for connection to one of said water carrying tubes and a recessed portion for connection to one of said helical coils;

the ends of each coil extending over the recessed portion of the associated connecting element and being clamped thereto by a rotor clip;

the inner diameter of said water carrying tubes being predetermined to be forced over the barbed portion of the associated connecting element and being secured thereto without the need for additional clamping elements;

a filter housing for said filter elements;

barbed connecting elements being mounted on said filter housing for coupling a pair of water supply tubes from said coils to said filter; and

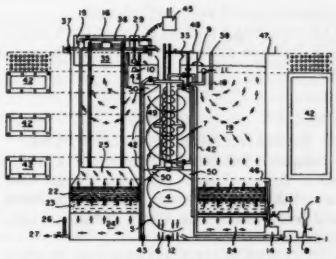
means for operating the system directly from the kitchen sink faucet, said means including a faucet spout having a diverter valve and a pair of barbed connecting elements for coupling water supply and return tubes to said faucet.

5,069,783

LIQUID TREATMENT APPARATUS

Lawrence K. Wang; Mu H. S. Wang, both of Latham; Chong S. Hwang, Flushing, and Harold Rhow, Hartsdale, all of N.Y., assignors to Int'l Environmental Systems, Inc., Pittsfield, Mass. and Globe Environmental Protection, Inc., Flushing, N.Y.

Filed May 16, 1990, Ser. No. 523,891
Int. Cl.[5] C02F *1/28*
U.S. Cl. 210—196 **6 Claims**



1. An apparatus for treating liquid, comprising in combination:

an inlet pipe with an in-line static mixing member;

a cylindrical outer tank having the bottom thereof as an outside wall of said apparatus;

a cylindrical inner open vessel disposed within said outer tank for flocculation and sedimentation;

means for introducing liquid to be flocculated from said inlet pipe into the bottom of said open vessel in a tangential direction so as to create a swirling action for flocculation;

means for removing settled, heavy silts, and sludges from the bottom of said open vessel;

means for removing clarified effluent from said open vessel and for introducing said clarified effluent into said cylindrical outer tank;

a cylindrical inner pressure vessel disposed within said open vessel for gas dissolution under pressure;

means for tangentially introducing liquid into said pressure vessel;

means for introducing at least one gas to be uniformly distributed and pressurized into said pressure vessel in which liquid flows in a tangential direction so as to create a swirling flow pattern for dissolving into said liquid gas;

means for measuring the flow rates of liquid and various gases in said inlet pipe, open vessel, and pressure vessel;

releasing means for introducing liquid containing dissolved gas to be depresssurized clarified from said pressure vessel into said outer tank for mixture with said clarified effluent for bubble generation and flotation purification;

sludge scooping and scraping means for removing scum and floated sludge from said outer tank;

sludge discharge means for transporting said scum and floated sludge through a sludge collection member to a dewatering device;

an adsorption and filtration bed near the bottom of said outer tank for downward purification of flotation clarified liquid;

a clear well compartment over the bottom of said outer tank for collection of adsorption and filtration purified liquid;

an outlet for discharging said adsorption and filtration purified liquid from said clear well;

backwashing means for periodically cleaning of said adsorption and filtration bed;

a moving carriage having a platform supported between the upper portion of the wall of said outer tank and the upper portion of the wall of said open vessel so as to hold said releasing means, sludge scooping and scraping means, backwashing means, a separator, and driving motors;

means for circular moving said moving carriage together with said releasing means, sludge scooping, and scraping means, backwash means, separator, and driving motors along outer and inner rails on said apparatus and around the vertical axis of said apparatus;

means for disinfecting liquid from said clear well using dry-chlorine;

means for feeding chemicals to said scum and floated sludge;

means for dewatering the liquid from said scum and floated sludge;

means for recycling a portion of waste liquid from said backwashing means to said open vessel to form said liquid to be depressurized and clarified; and

means for recycling a portion of liquid from said clear well or said flotation clarification effluent into said pressure vessel.

5,069,784

COAGULATION REACTION TANK

Naohiro Taniguchi, Yokohama; Syuzo Koike, Urawa; Yasuhiko Watanabe, Tokyo; Tadao Takeuchi, Tokyo, and Noboru Fujiwara, Tokyo, all of Japan, assignors to Japan Sewage Works Agency and Kurita Water Industries Ltd., both of Tokyo, Japan

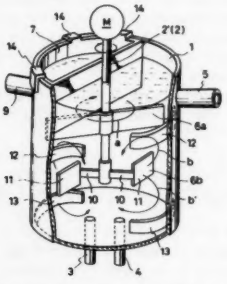
PCT No. PCT/JP88/01321, § 371 Date Jun. 22, 1990, § 102(e) Date Jun. 22, 1990, PCT Pub. No. WO89/06154, PCT Pub. Date Jul. 13, 1989

PCT Filed Dec. 23, 1988, Ser. No. 499,345

Claims priority, application Japan, Dec. 25, 1987, 62-327190

Int. Cl.[5] B01D *21/01;* **C02F** *1/52*

U.S. Cl. 210—205 **1 Claim**



1. A coagulation reaction tank comprising:

a cylindrical tank;

rotary stirring means positioned in a central part of said cylindrical tank and comprising stirring vanes for stirring sludge and a coagulant located within the tank interior and converting the sludge into floc; and

a filtration tank mounted on said cylindrical tank for admitting liquid from within said tank in the form of filtrate and discharging said filtrate out of said cylindrical tank;

wherein said filtration tank is mounted inside said cylindrical tank such that the bottom of said filtration tank falls above a region of rotation of said stirring vanes, the bottom of said filtration tank comprises slits formed in an arcuate shape concentrically with said cylindrical tank for introducing the liquid from within said cylindrical tank in the form of filtrate, and a distance between the upper edges of said stirring vanes and the lower surface of the bottom of said filtration tank is about 5 to 20 mm.

5,069,785

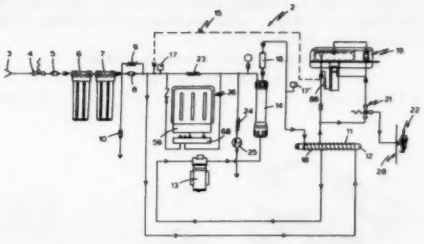
FLUID PURIFYING APPARATUS AND METHOD OF PURIFYING FLUIDS

Steven L. Miller, Shelby; Ronald L. Wathen, and Raymond E. Palazzo, Jr., both of Jefferson, all of Ky., assignors to Environmental Water Technology, Inc., Louisville, Ky.

Division of Ser. No. 515,459, Apr. 27, 1990. This application Oct. 11, 1990, Ser. No. 596,710

Int. Cl.[5] B01D *35/00*

U.S. Cl. 210—232 **7 Claims**



1. A bag assembly for storing fluids including at least two communicatively connected bag members comprising: means for cooperating with a liquid purification system, including, first and second placket members, each of which is sized and shaped to provide a portion of the enclosing walls of at least two bag members having at least one fluid inlet and outlet passage and a communicating passage therebetween, said plackets being positioned in joined relation; and, a common seam along the surrounding edges thereof to provide said bag assembly.

4. A method of forming a bag member assembly comprising: providing means for cooperating with a liquid purification system, by, forming two side placket members sized and geometrically configured to be joined along a common continuous seam to provide at least two bags joined by a connecting passage with at least one fluid inlet and outlet passage therein; and, joining said placket members together along said common continuous seam.

5,069,786

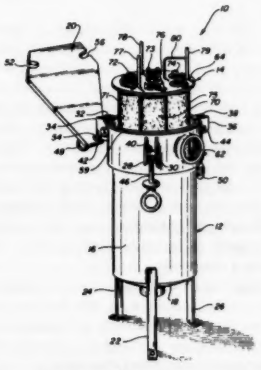
FILTER APPARATUS SNAP LOCK CARTRIDGE RETAINER

John L. Pulek, Newington, Conn., assignor to Cuno, Incorporated, Meriden, Conn.

Filed Jun. 15, 1989, Ser. No. 366,787

Int. Cl.[5] B01D *29/17*

U.S. Cl. 210—232 **11 Claims**



1. A filter apparatus comprising:

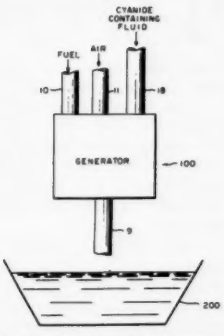
(a) a vessel having walls forming a chamber;
(b) a cartridge pack having a diaphragm for separating the chamber into a first and second chamber, the diaphragm having an upper and lower surface, and having at least one aperture therein;
(c) at least one cartridge for filtering fluid passing between the first and second chambers having connector member fixedly connected to a filter member, the connector having an upset portion for bearing against the lower surface of the diaphragm and an extended portion extending through the aperture with a groove;
(d) a snap locking ring displaced in the groove, for bearing against the upper surface of the diaphragm cantilevering the cartridge therein,
wherein the extended portion has a radial outer surface;
the radial outer surface having the groove with the snap locking ring and having a second groove axially spaced from the groove with the snap locking ring;
the second groove having an O-ring seal being in engagement with the aperture inner surface for preventing fluid flow through the aperture.

5,069,787

METHOD AND APPARATUS FOR REMOVING CYANIDE FROM A FLUID

Donald O. Hitzman, Bartlesville, Okla., assignor to Geo-Microbial Technologies, Inc., Ochelata, Okla.

Division of Ser. No. 483,508, Feb. 23, 1990, Pat. No. 4,975,193.
This application Dec. 3, 1990, Ser. No. 620,635
Int. Cl.[5] C02F *1/72*
U.S. Cl. 210—259 **4 Claims**



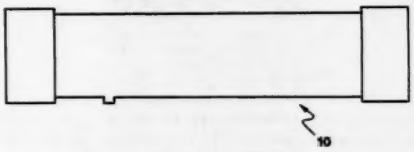
1. Apparatus for removing cyanide from fluid with the aid of cyanide-metabolizing microbes, comprising (a) a conduit for introducing fuel into a mixing zone; (b) means for delivering an annular stream of air to said mixing zone such that fuel and air are mixed in said mixing zone; (c) a combustion zone which communicates with said mixing zone through a perforated barrier to receive an air/fuel mixture; (d) means for effecting combustion of an air/fuel mixture in said combustion zone; (e) means for providing a quench fluid stream to quench said combustion comprising an annular chamber in indirect heat exchange with said combustion zone, said annular chamber communicating with said combustion zone through a plurality of annularly spaced apertures through which said quench fluid is introduced into a flame front in said combustion zone; said quench fluid stream containing a cyanide species, such that an effluent stream is produced which comprises hydrogen peroxide which oxidizes at least a portion of said cyanide species and organic material (f) means for conveying said effluent stream to a repository for cyanide-metabolizing microbes; and (g) a repository that contains cyanide-metabolizing microbes which degrade at least a portion of said cyanide species in said effluent stream, said microbes capable of using said organic material as a carbon source.

5,069,788

MULTI-PASS BLOOD WASHING AND PLASMA REMOVAL DEVICE AND METHOD

John M. Radovich, and Richard W. Schofield, both of Bend, Oreg., assignors to Pfizer Hospital Products Groups, Inc., New York, N.Y.

Division of Ser. No. 398,065, Aug. 24, 1989, Pat. No. 5,017,293.
This application Feb. 19, 1991, Ser. No. 657,124
Int. Cl.[5] B01D *61/28, 63/04*
U.S. Cl. 210—321.8 **8 Claims**



1. A combination cellular blood component washing and plasma removing device comprising means for enabling continuous washings concentration and separating including
(a) elongate microporous hollow fiber membranes arranged into at least two discrete fiber bundles, said hollow fiber membranes permitting the permeation of at least a portion of non-cellular blood components through the walls thereof while preventing the permeation of cellular blood components,
(b) a housing containing said fiber bundles, said housing having a blood inlet port, a plasma-depleted outlet port, a plasma permeate port, and washing means for contacting said cellular blood components with wash fluid and for removing said wash fluid from said housing prior to the exit of said cellular blood components from said plasma-depleted outlet port,
wherein the lumens of the hollow fiber membranes of said fiber bundles are in fluid communication with each other; said blood inlet port, said plasma-depleted outlet port, and said washing means are all in fluid communication with the lumens of the hollow fiber membranes of said fiber bundles; and said plasma permeate port is in fluid communication with the outside of the hollow fiber membranes of said fiber bundles.

5,069,789

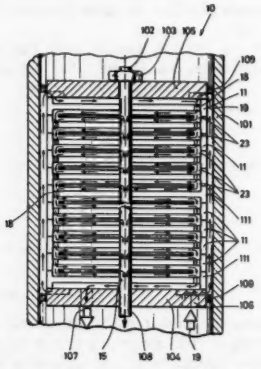
SPACER ELEMENT FOR GUIDING FLOWING MEDIUM

Jürgen Mohn, Reinbek, and Wilhelm Heine, Hamburg, both of Fed. Rep. of Germany, assignors to DT Membranfilter Vertiebs GmbH, Hamburg, Fed. Rep. of Germany

Filed Oct. 11, 1989, Ser. No. 420,054
Claims priority, application Fed. Rep. of Germany, May 10, 1989, 3915197
Int. Cl.[5] B01D *29/39*
U.S. Cl. 210—321.84 **9 Claims**

1. An arrangement including a spacer element for guiding flowing medium, particularly for apparatus for filtering and separating said flowing medium by microfiltration, ultrafiltration, and reverse osmosis, with a respective filter element being accommodated between each two essentially plate-like spacer elements, about which said medium flows, the improvement therewith wherein:
said spacer element comprises a plate member having a rim region in which is provided at least one passage for said flowing medium, with said plate member having two oppositely disposed plate-like surfaces, on at least one of which are disposed a plurality of raised bosses that project from said surface, with said filter element resting on said bosses, whereby said filter element is in the form of a diaphragm pad, with said medium flowing in transverse direction respectively diametrically on both sides thereof;
said spacer element having an outer, essentially circumferential rim on said two surfaces of said plate member thereof;
one of said rims being raised from said surface of said plate

member by at least the thickness of one of said filter elements;



chamber means existing between respectively two adjoining spacer elements; and

diaphragm pads located as supported by said bosses.

5,069,790

MULTIPLE DISC TYPE FILTER AND DISC CONSTRUCTION USEFUL THEREIN

Drori Mordeki, 89 Zahal Street, Kiron, Israel

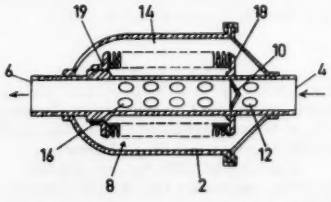
Continuation of Ser. No. 167,999, Mar. 14, 1988, Pat. No. 4,880,537, which is a continuation of Ser. No. 850,146, Apr. 10, 1986, Pat. No. 4,744,901. This application Oct. 10, 1989, Ser. No. 419,601

Claims priority, application Israel, Apr. 10, 1985, 74873

The portion of the term of this patent subsequent to May 17, 2005, has been disclaimed.

Int. Cl.[5] E01D *25/02*

U.S. Cl. 210—323.1 **41 Claims**



1. A filter, comprising: means for providing enhanced filtering capacity for a given filter volume, including a housing having an inlet connectable to an upstream pipe, and an outlet connectable to a downstream pipe; and a stack of discs disposed within said housing for separating solid particles from a fluid flowing between said discs from the upstream side of said stack to the downstream side thereof; characterized in that said stack includes:

a plurality of cooperating filter elements defining a plurality of paired co-operating filter surfaces, including a first surface defining a large surface area and a second surface contacting only a portion of said large surface area of said first surface and leaving a portion of the large surface area on the upstream side of the stack not contacted thereby, at least one of said first and second surfaces being formed with grooves at the areas at which said first and second surfaces contact, thereby to form:

a) compartments on the upstream side of the stack for accumulation of solid particles; and

b) edge filtering passageways extending along the grooves in contact with said second surface, which passageways define the minimum size of particles separated by the filter and extend from said compartments to the downstream side of the stack, and wherein said second surface is formed with serrated edge surfaces defining said compartments on the upstream side of the stack, thereby increasing the length along which edge filtering passageways are defined.

5,069,791

FILTER APPARATUS

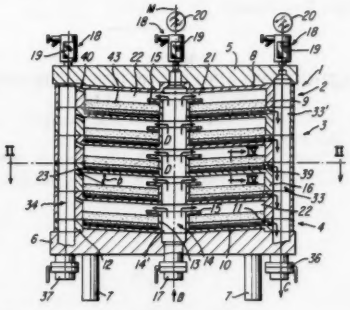
Hans F. Becker, Gensingen, and Dieter Rudolf, Bad Kreuznach, both of Fed. Rep. of Germany, assignors to Seitz Enzinger Noll Maschinenbau Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Jan. 11, 1990, Ser. No. 463,382

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1989, 3900934

Int. Cl.[5] B01D *24/00*

U.S. Cl. 210—344 **27 Claims**



1. A filter apparatus comprising:

a plurality of essentially horizontally disposed filter chambers which are formed by filter elements and which are disposed one above the other in the direction of a vertical central axis of said apparatus, with said filter chambers each being defined by wall means of said filter elements and being separated from one another by said wall means, with said wall means including a bottom wall and a peripheral outer wall;

at least one common unfiltered fluid inlet channel for the supply of a fluid that is to be filtered, said fluid inlet channel communicating with said filter chambers and being formed by channel sections disposed one above the other, with each of said channel sections being connected to a respective one of said bottom walls of said filter chambers;

at least one common filtrate outlet channel for withdrawing filtered fluid that is in communication with said filter chambers via said filter elements;

said filter elements comprising at least said bottom wall, said peripheral outer wall, a drainage means and a filter sheet, with said peripheral outer walls of said filter elements disposed above one another forming an outer peripheral casing of said apparatus;

said filter sheets of said respective filter elements of one of said filter chambers serving as an upper deposition surface for depositing at least one cake layer formed from at least one filtering aid, and separating said filter chamber into a filtrate collection area and into a filling space, with said filtrate collection area being arranged below said upper deposition surface and opening into said filtrate outlet channel, and with said filling space being disposed above said upper deposition surface of said filter sheets;

a respective annular distribution space for each of said filter chambers, with each of said distribution spaces extending about said central filter axis, opening at its periphery at a greater first radial distance from said central axis into a respective one of said filter chambers via discharge open-

ing means, with, at a lesser second radial distance from said central axis, each of said distribution spaces having at least one inlet opening means that is in communication with said unfiltered fluid inlet channel; and

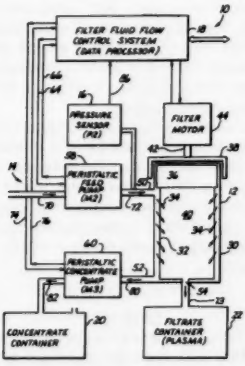
said unfiltered fluid channel being surrounded by said filter chambers and being disposed in the vicinity of said central filter axis, where it opens directly into said distribution spaces via said inlet opening means.

5,069,792

ADAPTIVE FILTER FLOW CONTROL SYSTEM AND METHOD

Paul R. Prince, San Juan Capistrano, and William D. Callaway, Huntington Beach, both of Calif., assignors to Baxter International Inc., Deerfield, Ill.

Filed Jul. 10, 1990, Ser. No. 551,598
Int. Cl.[5] B01C *13/00*
U.S. Cl. 210—627 **35 Claims**



1. A fluid flow control system for controlling a flow of filtrate through a filter system having a filter membrane with a predictable transmembrane pressure-filtrate flow rate-feed flow rate relationship when the filter system is operated under nonobstructing operating conditions, the control system comprising:

means for substantially precluding irreversible blocking of said filter membrane including,

a flow regulating system coupled to control flows of feed fluid, concentrate fluid and filtrate fluid in the filter system in response to at least one control signal;

a pressure sensor disposed to sense and generate indications of transmembrane pressure in the filter system; and

means for maintaining the transmembrane pressure at an operating point lying upon a particular three dimensional control surface having a shape conforming to the predictable transmembrane pressure-filtrate flow rate-feed flow rate relationship, and a pressure offset from the received pressure indication by a selected pressure difference.

5,069,793

MEMBRANE MODULE

Jurgen Kaschemekat; Richard W. Baker, both of Palo Alto, and Johannes G. Wijmans, Menlo Park, all of Calif., assignors to Membrane Technology & Research, Inc., Menlo Park, Calif.

Filed Sep. 12, 1990, Ser. No. 582,746
Int. Cl.[5] B01D *61/36*
U.S. Cl. 210—640 **43 Claims**

22. A pervaporation process, comprising:

providing a spiral-wound module, said module comprising:

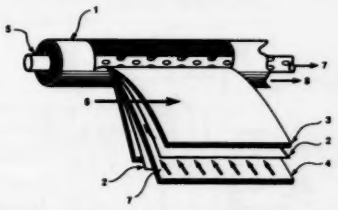
a membrane layer, having a feed side and a permeate side;

a feed spacer layer, placed generally contiguous with and parallel to said membrane layer on said feed side;

a permeate spacer layer, placed generally contiguous with and parallel to said membrane layer on said permeate side;

a permeate collection pipe, around which said layers are spirally wound;

contacting said feed side with a feed liquid containing a first component and a second component;



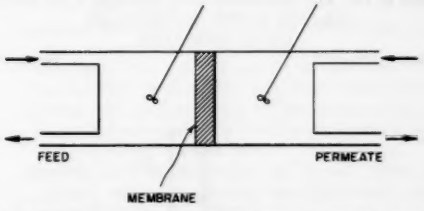
withdrawing from said permeate collection pipe a permeate flow throughput enriched in said first component compared with said feed liquid, wherein said permeate flow is at least 60% of the maximum possible permeate flow throughput.

5,069,794

SEPARATION OF MIXTURE COMPONENTS OVER MEMBRANE COMPOSED OF A PURE MOLECULAR SIEVE

Werner O. Haag, Lawrenceville, and John G. Tsikoyiannis, Princeton, both of N.J., assignors to Mobil Oil Corp., Fairfax, Va.

Continuation-in-part of Ser. No. 533,328, Jun. 5, 1990, Pat. No. 5,019,263. This application Mar. 25, 1991, Ser. No. 674,635
Int. Cl.[5] B01D *61/00*
U.S. Cl. 210—650 **18 Claims**



1. A process for the separation of components of a gaseous or liquid mixture having at least two components which comprises contacting a feedstream of the mixture with an upstream face of a non-composited, microporous membrane comprising a continuous array of crystalline molecular sieve material under separation conditions such that at least one component of the mixture has a greater steady state permeability through the membrane than at least one of the remaining components of the mixture, and recovering the component having the greater permeability on the downstream side of the membrane after contact with and passage through the membrane.

5,069,795

PROCESS FOR SEPARATING HYDROCARBONS FROM WASTE WATER

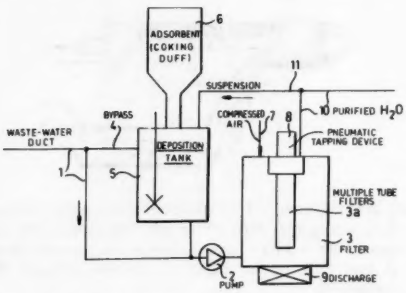
Ingo Romey, Hünxe, and Reinhard Pass, Essen, both of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

PCT No. PCT/EP87/0600, § 371 Date Apr. 5, 1989, § 102(e) Date Apr. 5, 1989, PCT Pub. No. WO88/02655, PCT Pub. Date Apr. 21, 1988
PCT Filed Oct. 14, 1987, Ser. No. 350,710
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1986, 3635461
Int. Cl.[5] B01D *37/02;* **C02F** *1/28*
U.S. Cl. 210—652 **8 Claims**

1. A process for the separating of both water-insoluble aro-

matic hydrocarbons and water-soluble aromatic hydrocarbons from a waste water containing same, which comprises the steps of:

(a) filtering the waster water through a slotted multiple tube filter on whose surface is coated an adsorbent layer of coking duff, said coking duff having a grain size distribu-



tion in the particle size range of between 0.05 and 0.2 mm and having a mass proportion of at least 25% by weight with a surface of at least 1500 cm^2/g, whereby the water-insoluble hydrocarbons and the water-soluble hydrocarbons are taken up by the adsorbent layer of coking duff in a single step to provide clean water as a filtrate; and

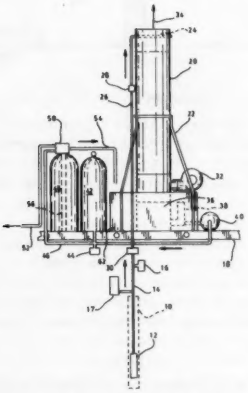
(b) discharging the clean water.

5,069,796

SYSTEM FOR REMOVING VOLATILE COMPONENTS FROM WATER DERIVED FROM WELLS

James R. Fox, 8737 Heathwood Bend, Knoxville, Tenn. 37923

Filed May 7, 1990, Ser. No. 519,641
Int. Cl.[5] B01D *15/04*
U.S. Cl. 210—664 **14 Claims**



12. A system for the removal of volatile contaminant substances from water within a well which contains said volatile contaminant substances, which comprises:

a well pump positioned within said well containing said contaminated water;

a portable base member;

a spray tower means mounted on said base member for receiving said well water from said well pump, said spray tower provided with an inlet line connecting said well pump to a spray means for dispersing said water downwardly within a top portion of said spray tower means;

air flow means attached to said spray tower means for passing air upwardly through said spray tower means countercurrently to said water from said spray means;

reservoir means disposed at a bottom portion of said spray tower means for receiving water after contact with said air, said water collected in said reservoir being substantially devoid of said volatile contaminant substances, said reservoir means provided with a water level detection means;

an activated carbon bed means mounted on said base member;

a pressurizing means mounted on said base member;

a pump means mounted on said base member for maintaining pressure in said pressurizing means and for receiving water from said reservoir means and delivering said water from said reservoir means to said activated carbon bed means under pressure;

control valve means attached to said activated carbon bed means for controlling flow of said water from said pump means through said activated carbon bed means in a downwardly direction during a first time period to produce a product water from said carbon bed means that is substantially free of said contaminants, and in a second and upwardly direction during a second time period to produce a waste water that contains contaminants that are back-flushed from said carbon bed by said flow of water in said opposite direction; and

a flow control unit mounted on said base means for receiving a signal indicating a demand for said product water and, upon receipt of said signal, operating said control valve means, initiating flow of said contaminated water to said spray tower and initiating operation of said pump means for delivering said water from said reservoir means to said activated carbon bed means under pressure to supply said product water.

5,069,797

VX ADSORPTION FROM A CHLOROFLUOROCARBON SOLVENT USING A MACRORETICULAR STRONG ACID RESIN

Philip W. Bartram, Abingdon; Noel C. DiBona, Apg, both of Md.; James H. Buchanan, Newark, Del., and Dennis K. Rohrbaugh, Bel Air, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 3, 1991, Ser. No. 637,028
Int. Cl.[5] G01D *15/04*
U.S. Cl. 210—690 **3 Claims**

3. In the process of decontaminating o-ethyl S-(2-diisopropylaminoethyl) methylphosphonothiolate from a chlorofluorocarbon solution, the improvement consisting essentially of contacting said solution containing o-ethyl S-(2-diisopropylaminoethyl) methylphosphonothiolate with a polydivinylbenzene strong acid resin.

5,069,798

CONTROL OF SCALE IN AQUEOUS SYSTEMS USING CERTAIN PHOSPHONOMETHYL AMINES

Chih M. Hwa, Palatine; John A. Kelly, Crystal Lake, both of Ill.; Janet Neton, West Chester, Ohio; Patricia M. Scanlon, Arlington, Mass., and Roger R. Gaudette, Hudson, N.H., assignors to W. R. Grace & Co.-Conn., New York, N.Y.

Filed Dec. 15, 1989, Ser. No. 451,484
Int. Cl.[5] C02F *5/14*
U.S. Cl. 210—700 **1 Claim**

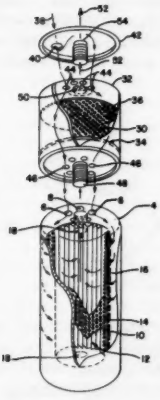
1. A process for inhibiting the formation of scale in an aqueous system consisting essentially of the step of incorporating into the system water an effective amount of a water soluble phosphonomethyl amine compound wherein the phosphonomethyl amine is selected from 4-(phosphonomethyl)-2-hydroxy-2-oxo-1,4,2-oxaxaphosphorinane and its sodium and potassium salts; and having a cloud point of at least 25 ppm as determined by a CA500 cloud point test.

5,069,799

METHOD FOR REJUVENATING LUBRICATING OILS

Darrell W. Brownawell, Scotch Plains, and Paul K. Ladwig, Randolph, both of N.J., assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Filed Sep. 7, 1989, Ser. No. 404,154
Int. Cl.[5] B01D *37/00*
U.S. Cl. 210—749 4 Claims



1. A method for rejuvenating a lubricating oil which comprises passing the lubricating oil, in series, through a filter system comprising a first filter housing that contains a chemically active filter media, a physically active filter media, or a mixture thereof, and then through a second filter housing that contains, in series, a chemically active filter media, a physically active filter media, or a mixture thereof, and an inactive filter media wherein in the first filter housing, the chemically active filter media contains at least two different chemically active filter media, wherein at least one chemically active filter medium is selected from the group consisting of a filter media containing a strong base, a filter media containing a hydroperoxide decomposer, and a filter media containing a dispersant function group, wherein the strong base is barium oxide (BaO), calcium carbonate ($CaCO_3$), calcium oxide (CaO), calcium hydroxide ($Ca(OH)_2$), magnesium carbonate ($MgCO_3$), magnesium hydroxide ($Mg(OH)_2$), magnesium oxide (MgO), sodium aluminate ($NaAlO_2$), sodium carbonate (Na_2CO_3), sodium hydroxide (NaOH), zinc oxide (ZnO), or their mixtures, and wherein the dispersant functional group complexes or reacts with sludge and varnish precursers in the oil.

5,069,800

CHEMICAL PROCESS FOR THE DENITRIFICATION OF WATER

Andrew P. Murphy, Littleton, Colo., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Aug. 22, 1990, Ser. No. 570,749
Int. Cl.[5] C02F *1/70, 1/58*
U.S. Cl. 210—757 4 Claims

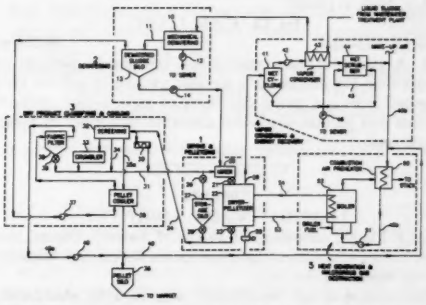
1. A chemical process for denitrification of water containing nitrate, sulfate and chloride ions by selectively reducing the nitrate ions comprising: regulating of said water between about 8.5 to about 11 with an alkali and adding a metal sufficiently electropositive to permit reduction of the nitrate ions to nitrogen or ammonia without consuming said metal by decomposing water to hydrogen.

5,069,801

INDIRECT HEAT DRYING AND SIMULTANEOUS PELLETIZATION OF SLUDGE

Mark J. Girovich, Baltimore, Md., assignor to Bio Gro Systems, Incorporated, Annapolis, Md.

Filed Feb. 26, 1990, Ser. No. 484,523
Int. Cl.[5] B01D *37/00*
U.S. Cl. 210—770 16 Claims



14. A process for treating liquid sludge obtained from a waste water treatment plant, comprising the steps of:

dewatering the liquid sludge to obtain a dewatered sludge product, mixing a pellet forming nuclei substance into the dewatered sludge to produce a mixture, inputting the mixture into a dryer that performs indirect heat drying and simultaneous pelletizing of the mixture by coating the nuclei with the dewatered sludge during mixing and drying to build up the pellets layer by layer to a predetermined size;

supplying sweep-air to the dryer for removing an air and water vapor mixture from the dryer;

extracting a dried product and the air and water vapor mixture from the dryer separately from one another;

classifying the product exiting the dryer into on-spec and fines fractions, wherein the fines fraction is smaller in size than the on-spec fraction; and

recycling the fines fraction for use in said mixing step, wherein said pellet forming nuclei substance consists essentially of the fines fraction.

5,069,802

GAS FLOOD SURFACTANTS ENRICHED IN OLEFIN DISULFONATE

John K. Borchardt, and Hon Chung Lau, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 286,394, Dec. 19, 1988, abandoned.
This application Nov. 9, 1990, Ser. No. 614,060
Int. Cl.[5] E21B *43/22*
U.S. Cl. 252—8.554 11 Claims

1. A gas foam surfactant mixture useful for recovering hydrocarbons from a reservoir, consisting essentially of:

olefin sulfonate surfactant, in an aqueous phase, said olefin sulfonate surfactant containing at least about 30 wt % disulfonate, said surfactant derived from olefins with carbon numbers in the range of from about 20 to about 32, wherein said disulfonate comprises alkene and hydroxy alkane disulfonic acid salts, and said surfactant in a concentration of from about 0.05 wt % to about 5.0 wt % of said aqueous phase of the mixture;

a chloride salt of potassium or sodium, in a concentration of from about 0.01 wt % to about 15.0 wt% of the aqueous phase of the mixture; and

a gas phase which consists essentially of a noncondensable gas, selected from the group consisting of carbon dioxide and nitrogen.

5,069,803

SYNTHETIC RESIN COMPOSITION CONTAINING GALLIUM PARTICLES AND USE THEREOF IN THE GLIDE SURFACING MATERIAL OF SKIS AND OTHER APPLICATIONS

Kentaro Sugimura, Chiba; Shoji Hasimoto, Kosakamachi, and Takayuki Ono, Sendai, all of Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Filed Sep. 18, 1989, Ser. No. 408,770

Claims priority, application Japan, Apr. 27, 1989, 1-108126; Jul. 7, 1989, 1-176497

Int. Cl.[5] C10M *125/04*

U.S. Cl. 252—26 30 Claims

1. A synthetic resin composition comprising particles no larger than 150 microns of a metallic gallium or gallium alloy selected from the group consisting of gallium-zinc, gallium-indium and gallium-aluminum dispersed uniformly in a synthetic resin.

5,069,804

LUBRICATING OIL ADDITIVES

John F. Marsh, Abingdon, and Joseph M. Swietlik, Oxford, both of United Kingdom, assignors to Exxon Research & Engineering, Florham Park, N.J.

Continuation of Ser. No. 896,572, Aug. 18, 1986, abandoned, which is a continuation of Ser. No. 492,474, May 6, 1983, abandoned. This application Aug. 17, 1988, Ser. No. 232,952

Claims priority, application United Kingdom, May 14, 1982, 8214192

Int. Cl.[5] C10M *159/22*

U.S. Cl. 252—42.7 14 Claims

1. An additive concentrate for incorporation in lubricating oil composition consisting essentially of lubricating oil; and from 10 to 90 wt. % of overbased alkaline earth metal hydrocarbyl sulphurized phenate which has been treated, either during or subsequent to overbasing, with from 0.1 to 10 weight %, based on the weight of the additive concentrate, of stearic acid or anhydride or salt thereof, and which has a total base number of 235–300.

5,069,805

PHENOLIC BENZOTHIAZOLE DERIVATIVES AND THEIR USE AS CORROSION INHIBITORS

Adalbert Braig, Weil-Friedlingen, Fed. Rep. of Germany; Hans-Rudolf Meier; David G. Leppard, both of Marly, Switzerland; Robert C. Wasson, Penketh, and Emyr Phillips, Sale, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

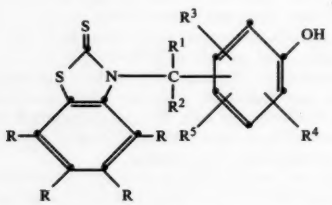
Division of Ser. No. 393,612, Aug. 14, 1989, which is a division of Ser. No. 86,337, Aug. 17, 1987, Pat. No. 4,894,091. This application Sep. 14, 1990, Ser. No. 583,775

Claims priority, application United Kingdom, Aug. 27, 1986, 8620668

Int. Cl.[5] C10M *135/36*

U.S. Cl. 252—47.5 13 Claims

1. A composition composed of a lubricant and containing 0.01 to 5% by weight, based on lubricant, of at least one compound of formula I



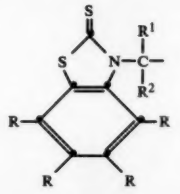
(I)

in which each R independently of one another is hydrogen, C_1–C_{12}-alkyl, C_1–C_4-halogenalkyl, C_1–C_{12}-alkoxy, C_1–C_{12}-alkylthio, phenylthio, benzylthio, C_1–C_{12}-alkylsulfonyl, phenyl, C_7–C_{15}-alkylphenyl, C_7–C_{10}-phenylalkyl, C_5–C_8-cycloalkyl, halogen, $-NO_2$, $-CN$, $-COOH$, $-COO-(C_1$–C_4-alkyl), $-OH$, $-NH_2$, $-NHR^6$, $-N(R^6)_2$, $-CONH_2$, $-CONHR^6$ or $-CON(R^6)_2$,

R^1 is hydrogen, C_1–C_{12}-alkyl, phenyl, phenyl which is substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or $-NO_2$, pyridyl, thienyl, or furyl,

R^2 is hydrogen or C_1–C_4-alkyl,

R^3 and R^4 independently of one another are hydrogen, halogen, C_1–C_4-alkoxy, cyano, nitro, C_1–C_{20}-alkyl, $-(CH_2)_m$ $COOR^7$, $-(CH_2)_m$ $CONHR^6$, $-(CH_2)_m$ $CON(R^6)_2$, C_3–C_{20}-alkenyl, C_7–C_{10}-phenylalkyl, phenyl, cyclohexyl, cyclopentyl or a group of the formula II



(II)

R^6 is hydrogen, C_1–C_{20}-alkyl, C_3–C_{20}-alkenyl or hydroxy, or R^3 and R_5 together or R^4 and R^5 together form a ring fused to the phenolic moiety which ring may be a carbocyclic or heterocyclic ring containing oxygen, nitrogen or sulfur as heteroatoms, each ring being optionally substituted by C_1–C_4-alkyl, C_1–C_4-alkoxy or halogen, R^6 is C_1–C_{12}-alkyl, C_3–C_{12}-alkyl which is interrupted by one or more 0 atoms, C_5–C_8-cycloalkyl, benzyl, phenyl, or phenyl which is substituted by halogen, C_1–C_4-alkyl, C_1–C_4-alkoxy or nitro, or $-N(R^6)_2$ is a pyrrolidino, piperidino or morpholino group, R^7 is hydrogen or C_1–C_{20}-alkyl, which may be substituted by halogen or hydroxyl or R^7 is C_3–C_{20}-alkyl which is interrupted by one or more oxygen atoms and may be substituted by hydroxyl and m is 0, 1 or 2.

5,069,806

SOLID DRY FILM PRELUBE WITH LOW TEMPERATURE CLEANABILITY

Robert L. Trivett, Aurora, Ill., assignor to Nalco Chemical Company, Naperville, Ill.

Continuation-in-part of Ser. No. 428,904, Oct. 27, 1989, abandoned. This application Mar. 4, 1991, Ser. No. 664,392

Int. Cl.[5] C10M *129/74*

U.S. Cl. 252—52 A 12 Claims

1. A hot-melt lubricant to be liquified, applied in the liquid state to a steel substrate to be fabricated, cooled on the substrate to provide a flexible prelubricating solid film removed by a hot alkaline solution after fabrication, and consisting essentially of the following in weight percent:

hydrogenated tallow triglyceride lubricant which is the reaction product of an aliphatic polyhydric alcohol and C_2–C_{26} carboxylic acids, 80–90% esterified castor oil plasticizer, 4–14%; and an aromatic polyether surfactant which is the reaction product of an aromatic alcohol having a C_{14}–C_{20} hydrophobe carbon chain with 5 to 15

moles of ethylene oxide and 10 to 20 moles of propylene oxide per mole of alcohol, about 5%.

5,069,807

BINDER COMPOSITION FOR USE IN MAGNETIC RECORDING MEDIA

Takatoshi Ohkubo, Atsugi, Japan, assignor to Minnesota Mining and Manufacturing Co., St. Paul, Minn.

Continuation-in-part of Ser. No. 315,304, Mar. 1, 1989, abandoned. This application Nov. 16, 1989, Ser. No. 437,646

Int. Cl.[5] H01F *1/00;* **C08G** *18/28, 18/70;* **C08L** *75/04*

U.S. Cl. 252—62.54 **21 Claims**

10. A dispersion for use in magnetic recording media, comprising:

(a) a binder composition which comprises:

(i) from about 10 to about 90 parts by weight of a curable, sulfonated, hydroxy-functional polyurethane polymer, which comprises a first plurality of SO_3M groups pendant from the polyurethane polymer backbone, wherein the polyurethane polymer has an SO_3M equivalent weight of from about 2,000 to about 100,000, and wherein M is selected from the group consisting of H^+, Li^+, Na^+, K^+, $NR_4^+$where R can be H^+or an alkyl group, and mixtures thereof; and a first plurality of cross-linkage hydroxyl groups wherein the polyurethane polymer has a hydroxyl equivalent weight of from about 500 to about 10,000, and wherein at least a majority of the hydroxyl groups are pendant from the polyurethane polymer backbone at locally hydrophobic sites;

(ii) from about 10 to about 90 parts by weight of a curable, sulfonated, hydroxy-functional vinyl chloride copolymer, which comprises a second plurality of SO_3M groups pendant from the vinyl chloride copolymer backbone, wherein the vinyl chloride copolymer has an SO_3M equivalent weight of from about 2,000 to about 100,000, and wherein M is selected from the group consisting of H^+, Li^+, Na^+, K^+, NR_4^+ where R can be H^+ or an alkyl group, and mixtures thereof; and a second plurality of cross-linkable hydroxyl groups wherein the vinyl chloride copolymer has a hydroxyl equivalent weight of from about 500 to about 10,000; and

(b) a pigment dispersed in said binder composition;

wherein said polyurethane polymer is obtained by reacting a sulfonated polyisocyanate prepolymer having at least two reactive isocyanate groups and having substantially no hydroxy functionality; and a hydrophobic polyol having at least three reactive hydroxy groups, wherein said hydrophobic polyol is present in a sufficient amount such that there is at least about a 67% excess of reactive hydroxy groups relative to reactive isocyanate groups.

5,069,808

WASHING OR DETERGENT COMPOSITION CONTAINING LACTOBIONIC ACID OR LACTOBIONIC ACID SALTS

Klaus-Guenter Gerling, Laatzen, and Detlef Wilke, Wennigsen, both of Fed. Rep. of Germany, assignors to Kali-Chemie AG, Hanover, Fed. Rep. of Germany

Filed Apr. 6, 1990, Ser. No. 505,569

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1989, 3914293

Int. Cl.[5] C11D *7/54, 3/22, 3/04*

U.S. Cl. 252—99 **12 Claims**

1. A washing or detergent composition comprising a surfactant, a boron/oxygen compound, and lactobionic acid or a lactobionic acid salt as a builder, wherein said lactobionic acid or lactobionic acid salt is present in said composition in an amount in the range from an effective builder amount up to 40% by weight of the total composition, and said boron/oxygen compound is present in said composition in such an amount that the composition contains at least one mole of boron per mole of lactobionic acid or lactobionic acid salt.

5,069,809

ENZYMATIC DETERGENT AND BLEACHING COMPOSITION CONTAINING A SPECIFIC RDNA TECHNIQUE CLONED LIPASE

Cornelis A. Lagerwaard, Hellevoetsluis; Johannes M. Cornelissen, Vlaardingen; Ton Swarthoff, Hellevoetsluis; Jan Klugkist, Vlaardingen, all of Netherlands, and David Thom, Parkgate, England, assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Continuation of Ser. No. 349,030, May 9, 1989, abandoned. This application Jun. 19, 1990, Ser. No. 541,184

Claims priority, application United Kingdom, May 9, 1988, 8810954

The portion of the term of this patent subsequent to Sep. 6, 2005, has been disclaimed.

Int. Cl.[5] C11D *3/386, 3/39, 3/395*

U.S. Cl. 252—174.12 **6 Claims**

1. A detergent composition comprising from 1–50% by weight of one or more detergent-active materials, from 0–60% by weight of a builder, from 1–50% by weight of a bleaching agent and lipolytic enzyme in an amount of 0.005–100 lipolytic units per milligram of the composition, characterised in that the bleaching agent is based on an inorganic or organic peracid or salt thereof which is stronger than peracetic acid or comprises a bleaching agent and a bleach precursor which yields, on perhydrolysis, a peracid faster than the system comprising sodium perborate+tetraacetyl ethylene diamine, and the lipolytic enzyme is a lipase produced by cloning by rDNA technique the gene encoding the lipase produced by *Humicola lanuginosa* (syn. *Thermomyces lanuginosus*) and expressing the gene in *Aspergillus oryzae* as host.

5,069,810

CLEANING COMPOSITION COMPRISING MICROBIAL LIPASE SD2 AND SODIUM DODECYLBENZENE SULFONATE

Paul E. Holmes, Hamden; Katherine P. Roberts, Derby, and Christine M. August, Plainville, all of Conn., assignors to Olin Corporation, Cheshire, Conn.

Continuation-in-part of Ser. No. 324,062, Mar. 16, 1989. This application Oct. 30, 1989, Ser. No. 428,550

Int. Cl.[5] C11D *3/386, 1/24, 7/42*

U.S. Cl. 252—174.12 **6 Claims**

1. A detergent composition comprising the microbial lipase SD2 and dodecylbenzene sulfonate, wherein said lipase is present in an amount of between about one million and about 100 million lipase units per kilogram of dodecylbenzene sulfonate in the detergent composition, and wherein said dodecylbenzene sulfonate is present in an amount of between about 0.01 and about 20 weight percent based upon the total weight of said detergent composition.

5,069,811

COMPOSITIONS FOR THE SULPHATION-REMOVING CLEANING OF CARBONATIC LITHOIDAL SURFACES

Giuseppe Pizzigoni, Varese, and Paolo Parrini, Novara, both of Italy, assignors to Larac S.p.A., Varese, Italy

Continuation-in-part of Ser. No. 103,284, Oct. 1, 1987, abandoned. This application Nov. 21, 1989, Ser. No. 439,808

Claims priority, application Italy, Oct. 6, 1986, 21905 A/86

Int. Cl.[5] C11D *3/10*

U.S. Cl. 252—174.14 **8 Claims**

1. Improved composition for the sulphation-removing cleaning of lithoidal surfaces of prevailing carbonatic nature, or of layers of the same nature deposited on different materials, comprising an active mixture of water or of an aqueous solution of ammonium carbonate, ammonium bicarbonate or mixtures thereof, with an anion-exchange material and a filler in an amount from 2 to 70% by weight being selected from the

group consisting of powders and fibrils of hydrophilic materials whereby the composition has a rheological behavior which is pseudoplastic, plastic and thixotropic.

5,069,812

BLEACH/BUILDER PRECURSORS

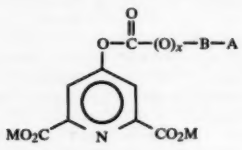
Robert W. R. Humphreys, Oradell; Bijan Harirchian, South Orange, both of N.J., and Frans L. M. Smeets, Julianalaan, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Dec. 10, 1990, Ser. No. 624,811

Int. Cl.[5] C09K *13/00*; C11D *7/54*; C07D *211/00*

U.S. Cl. 252—186.44 **6 Claims**

1. A multifunctional compound of the formula



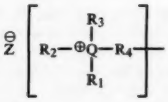
where x may be 0 or 1;

where M is alkali metal or hydrogen;

where B is $(CH_2)_y$ and y is 2–8 or where B is aryl, substituted aryl, or heterocyclic;

where A is R and R may be about C_{1-14} alkyl, aryl, substituted alkyl, or substituted aryl,

or where A is



and

R_1, R_2 and R_3 are each independently a radical selected from the group consisting of alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkenyl, alkaryl, aryl, hydroxyalkyl, polyoxyalkylene, and $R_4(O)_mC(O)_nR_1$;

or two or more of R_1, R_2 and R_3 together form an alkyl substituted or unsubstituted nitrogen-containing heterocyclic ring system;

or at least one of R_1, R_2 and R_3 is attached to R_4 to form an alkyl substituted or unsubstituted nitrogen-containing heterocyclic ring system; and

R_4 is selected from a bridging group consisting of alkylene, cycloalkylene, alkylenephenylene, phenylene, arylene, and polyalkoxylene, and wherein the bridging group can be unsubstituted or substituted with C_1–C_{20} atoms selected from alkyl, alkenyl, benzyl, phenyl and aryl radicals;

Z^- is a monovalent or multivalent anion leading to charge neutrality when combined with Q^+ in the appropriate ratio and wherein Z^- is sufficiently oxidatively stable not to interfere significantly with bleaching by a peroxy carbonic acid;

Q is nitrogen or phosphorous;

m and n are the same or different and either 0 or 1 or where B and A together are 2,4 pyridine dicarboxylic acid sodium salt.

5,069,813

ELECTRICALLY CONTROLLED POLARIZATION-INDEPENDENT LIQUID CRYSTAL FRESNEL LENS

Jayantilal S. Patel, Red Bank, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Filed Dec. 10, 1990, Ser. No. 626,205

Int. Cl.[5] C09K *19/52, 19/56*; G02F *1/13*

U.S. Cl. 252—299.01 **14 Claims**

1. An assembly comprising a layer of liquid crystal material having liquid crystalline molecules each of which has a principal axis, said layer having two main spaced-apart parallel planar surfaces,

means for quiescently establishing in said layer of liquid crystal material, in the absence of an applied field, plural successive zones in which the principal axes of at least some of the liquid crystalline molecules in each zone of said layer are parallel to said surfaces and orthogonal with respect to the principal axes of at least some of the liquid crystalline molecules in adjacent zones thereby to define the zones of a binary-phase Fresnel lens,

and means for establishing a uniform field in said layer of liquid crystal material to change the orientation of the principal axes of at least some of the molecules in each of said zones.

5,069,814

BENZOIC ACID DERIVATIVE HAVING A LARGE POSITIVE DIELECTRIC ANISOTROPY VALUE

Toshiharu Suzuki; Yasuyuki Goto, both of Ichiharashi, and Kisei Kitano, Chibashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

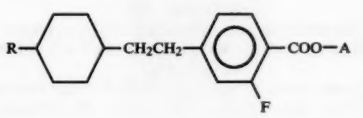
Filed Feb. 14, 1990, Ser. No. 480,118

Claims priority, application Japan, Mar. 2, 1989, 1-50592

Int. Cl.[5] C09K *19/20*; C09C *69/76*; C07C *255/00*

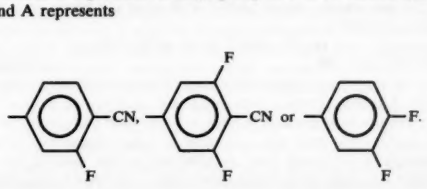
U.S. Cl. 252—299.67 **20 Claims**

1. A benzoic acid derivative expressed by the formula



(I)

wherein R represents an alkyl group of 1 to 10 carbon atoms and A represents



5,069,815

POWDER ELECTROLUMINESCENT ELEMENT COMPRISING INORGANIC ELECTROLUMINESCENT PARTICLES AND A POLYURETHANE BINDER

Akira Aoki; Yukio Fujishima, both of Sakai; Yusuke Makio, Takatsuki; Susumu Kusakawa, Yokkaichi; Sadaaki Tsuji, Yokkaichi, and Tadashi Okamura, Mie, all of Japan, assignors to Osaka-Fu, Osaka and Itoh Seiyu Kabushiki Kaisha, Yokkaichi, both of, Japan

Filed Dec. 1, 1989, Ser. No. 444,226

Claims priority, application Japan, Dec. 3, 1988, 63-306740

Int. Cl.[5] C09K *11/02*

U.S. Cl. 252—301.36 **2 Claims**

1. A powder electroluminescent element comprising inorganic electroluminescent particles and an organic binder having a dielectric constant of not less than 7 at 1 kHz, said organic binder comprising a polyurethane having admixed therewith a cyanoethyl-, halogen- or nitro-containing compound having a dielectric constant of not less than 7 at 1 kHz.

5,069,816

ZIRCONIUM SILICA HYDROGEL COMPOSITIONS AND METHODS OF PREPARATION

Dominick A. DeSantis, Hillsborough, and Robert A. Paul, Freehold, both of N.J., assignors to MMII Incorporated, Linden, N.J.

Continuation of Ser. No. 142,144, Jan. 11, 1988, abandoned. This application Jul. 2, 1990, Ser. No. 547,387

Int. Cl.[5] B01J *13/00, 21/08*

U.S. Cl. 252—315.5 **32 Claims**

1. A substantially pure zirconium silica hydrogel containing at least about five wt. % water bound as a hydrate in its as-dried form comprising silicon and zirconium including silicon as SiO_2 in an amount of between about 60 and 99 wt. % of said hydrogel and zirconium as ZrO_2 in an amount of between about 1 and 40 wt. % of said hydrogel, wherein substantially all of said zirconium is bound to said SiO_2 in said hydrogel, and said hydrogel is substantially free of silica gel which is not bound to said zirconium, said hydrogel having a surface hydroxyl content greater than about one OH group per nm^2.

5,069,817

PROCESS FOR MAKING POLYOXYETHYLENE SURFACTANTS WITH DESIRABLE LOW TEMPERATURE BEHAVIOR

Karl Schmid, Mettmann; Alfred Meffert, Monheim; Klaus Friedrich, Duesseldorf; Michael Langen, Hilden, and Klaus Herrmann, Monheim, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jan. 25, 1989, Ser. No. 301,423

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1988, 3802027

The portion of the term of this patent subsequent to Dec. 11, 2007, has been disclaimed.

Int. Cl.[5] B01F *17/42;* **C07C** *41/03, 41/34*

U.S. Cl. 252—351 **20 Claims**

1. A process for the production of alkyl, alkenyl, or mixed alkyl and alkenyl polyoxyethylenes comprising:

(a) reacting alcohol molecules according to the general chemical formula R-OH wherein R is any alkyl or alkenyl group, with ethylene oxide in the presence of a basic alkali metal compound as catalyst, to produce a liquid phase containing R-polyoxyethylenes and said catalyst; and

(b) neutralizing the basic catalyst by adding acid to the liquid phase containing the basic catalyst,

wherein the improvement comprises the conditions that:

(A) the amount of basic alkali metal catalyst used is sufficient that solid precipitate, including salt combining anions of the neutralizing acid with cations of the alkali metal compound catalyst, is formed during neutralization, the amount of said basic alkali metal catalyst being stoichiometrically equivalent to a specified mass of sodium methylate, said specified mass of sodium methylate being a mass that is the sum of (i) between about 0.8 and about 1.1% of the combined masses of any sterically unhindered alcohol reacted and of the ethylene oxide reacted therewith and (ii) between about 1.4 to about 1.8% of the combined masses of any sterically unhindered alcohol reacted and of the ethylene oxide reacted therewith;

(B) finely divided solids are dispersed within the fluid phase containing the catalyst before any part of the neutralizing step in which said solid precipitate of part (A) is formed; and

(C) the neutralized liquid phase is separated from any solids contained therein.

5,069,818

FUNCTIONALIZED POLYPHENYLENE ETHERS AND BLENDS WITH POLYAMIDES

David F. Aycock, Glenmont, and Sai-Pei Ting, Delmar, both of N.Y., assignors to General Electric Company, Selkirk, N.Y.

Division of Ser. No. 780,151, Sep. 26, 1985, Pat. No. 4,824,915. This application Mar. 13, 1989, Ser. No. 322,788

The portion of the term of this patent subsequent to Dec. 15, 2004, has been disclaimed.

Int. Cl.[5] C08L *71/12*

U.S. Cl. 525—397 **4 Claims**

1. A functionalized-polyphenylene ether compound comprised of the reaction product of a polyphenylene ether polymer and a compound having the general formula (i)-Z-(ii) that contains both group (i) which is at least one polyphenylene ether-philic acylfunctionalized moiety; and group (ii) which is at least one polyamide-philic moiety; and wherein Z is a divalent hydrocarbon radical linking groups (i) and (ii), provided that groups (i) and (ii) are not both the simultaneously carboxylic acid groups.

5,069,819

THIOESTERS AND ANTIOXIDANT COMPOSITIONS CONTAINING THE SAME

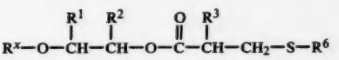
Budd H. Sturm, Hartville, and Joseph A. Kuczkowski, Munroe Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 10, 1990, Ser. No. 579,903

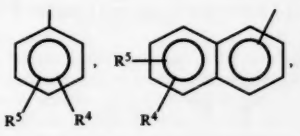
Int. Cl.[5] C09K *15/26;* **C07C** *323/53*

U.S. Cl. 252—402 **8 Claims**

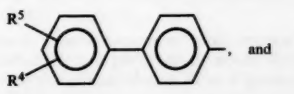
1. A compound of the following structural formula:



wherein R^x is selected from the group of formulae consisting of:



and



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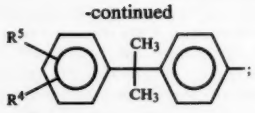
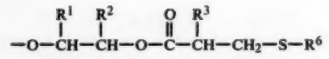
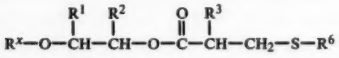


R^1, R^2 and R^3 are independently selected from the group consisting of hydrogen or methyl; R^4 and R^5 are independently selected from the group consisting of hydrogen, alkyl having 1 to 18 carbon atoms, aryls having 6 to 10 carbon atoms, aralkyls having 7 to 9 carbon atoms, and a radical of the formula:

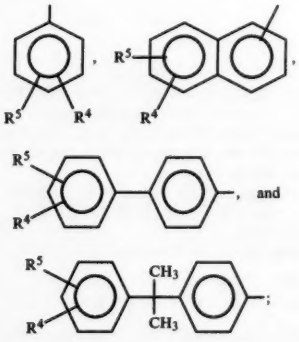


and R^6 is selected from the group consisting of alkyls having 1 to 24 carbon atoms, aryls having 6 to 12 carbon atoms and aralkyls having 7 to 12 carbon atoms.

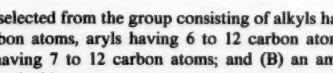
3. An antioxidant system comprising (A) a thioester having the following structural formula:



wherein R^x is selected from the group of formulae consisting of:



R^1, R^2 and R^3 are independently selected from the group consisting of hydrogen or methyl; R^4 and R^5 are independently selected from the group consisting of hydrogen, alkyls having 1 to 18 carbon atoms, aryls having 6 to 10 carbon atoms, aralkyls having 7 to 9 carbon atoms, and a radical of the formula:



and R^6 is selected from the group consisting of alkyls having 1 to 24 carbon atoms, aryls having 6 to 12 carbon atoms and aralkyls having 7 to 12 carbon atoms; and (B) an amine or phenolic antioxidant.

5,069,820

THERMALLY STABLE FORMS OF ELECTRICALLY CONDUCTIVE POLYANILINE

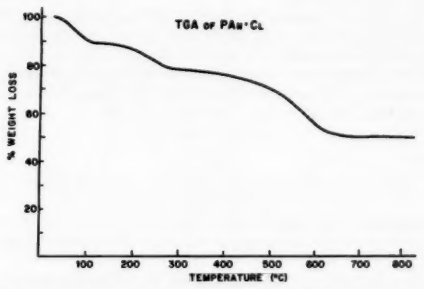
Kway-Yue A. Jen, Succasunna, and Ronald L. Elsenbaumer, Morristown, both of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Aug. 7, 1987, Ser. No. 82,886

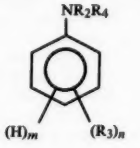
The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.

Int. Cl.[5] H01B *1/00, 1/06*

U.S. Cl. 252—500 64 Claims



1. An electrically conductive thermally stable polymer comprising a substituted or unsubstituted polyaniline of film forming molecular weight prepared by polymerizing an aniline of the formula:



having dispersed therein a dopant solute of the formula:

R_1SO_3—

in an amount sufficient to provide a doped polyaniline having a conductivity of at least about 10^{-5} ohm^{-1}cm^{1}, wherein:

R_1 is a substituted or unsubstituted organic radical;

n is an integer from 0 to 4;

m is an integer from 0 to 5 with the proviso that the sum of n and m is 5;

R_2 and R_4 are the same or different at each occurrence and are hydrogen or alkyl; and

R_3 is alkyl, alkenyl, alkoxy, cycloalkyl, cycloalkenyl, alkanoyl, alkylthio, aryloxy, alkylthioalkyl, alkylaryl, arylalkyl, alkylsulfinyl, alkoxyalkyl, alkylsulfonyl, aryl, arylthio, arylsulfinyl, alkoxycarbonyl, alksilyl, arylsulfonyl, carboxylic acid, halogen, cyano, or alkyl substituted with one or more sulfonic acid, carboxylic acid, halogen cyano or epoxy moieties; or any two R_3 substituents taken together are an alkylene or alkenylene group completing a 3, 4, 5, 6 or 7 membered aromatic or alicyclic carbon ring or any two R_3 substitutents together may form an alkylene or alkenylene group completing a 3, 4, 5, 6 or 7 membered aromatic or alicyclic ring structure which includes one or more divalent ester, carbonyl, nitrogen, sulfur, sulfinyl, sulfonyl or oxygen, or R_3 is an aliphatic moiety having repeat units of the formula:

$—(OCH_2CH_2)_qO—$, or $—(OCH_2CH(CH_3))_qO—$

wherein q is a positive whole number; with the proviso that R_1, R_2, R_3 and R_4 substituents individually include from 1 to about 30 carbon atoms.

5,069,821

STABLE SODIUM TETRAPHENYLBORATE SOLUTIONS

John M. Birmingham, Platteville, and Jeffrey M. Sullivan, Longmont, both of Colo., assignors to Boulder Scientific Company, Mead, Colo.

Filed Feb. 15, 1989, Ser. No. 310,955
Int. Cl.[5] H01B 1/00; C09K 3/00; C01G 56/00
U.S. Cl. 252—500 5 Claims

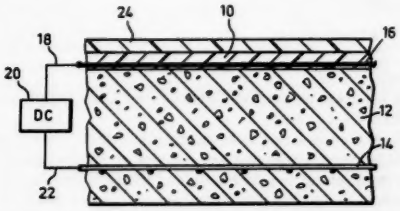
1. An aqueous solution of sodium tetraphenylborate in sodium hydroxide or lithium hydroxide, the molarity of hydroxide in said solution being in the range of from about 0.07 to about 0.09, when measured to an endpoint of pH 7, said sodium tetraphenylborate being stable in said solution at a temperature ob 65° C.

5,069,822

PROTECTIVE COATING FOR REINFORCED CONCRETE

Thomas M. Callaghan, 54 Franklin Avenue, Willowdale, Ontario, Canada M2N 1B6 ; Vallabhdas M. Pasta, 202 Mohawk Road, Oakville, Ontario, Canada L6L 2Z2 ; Vasant D. Kale, 60 Alexander Street, Tottenham, Ontario, Canada L0G 1W0 , and Charles A. Bruce, 25 Danville Drive, Willowdale, Ontario, Canada M2P 1J1

Continuation-in-part of Ser. No. 61,473, Jun. 15, 1987, abandoned. This application Apr. 10, 1989, Ser. No. 335,430
Int. Cl.[5] H01B 1/00
U.S. Cl. 252—511 12 Claims



1. In a concrete structure containing steel reinforcing bars, a cathodic protection system comprising:

(a) a moisture impervious membrane of polymeric elastomeric material selected from the group consisting of chloroprene rubber, blocked urethane, and chloroprene including a wetting agent, and an anti-oxidant, applied to the structure, the membrane having electrically conductive particulate matter selected from the group consisting of metallic powder, nickel coated graphite fibers, carbon fibers and conductive carbon black evenly dispersed therein;

(b) an electrically conductive grid embedded in the membrane or contiguous thereto; and

(c) direct current means connecting the grid electrically with the reinforcing bars.

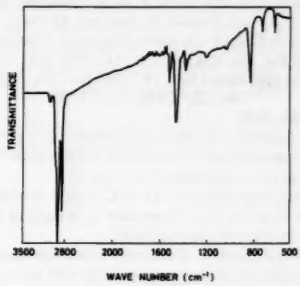
5,069,823

THIOPHENE COMPOUND AND METHOD FOR PRODUCTION THEREOF

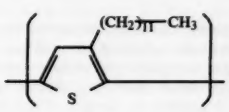
Masa-aki Sato, and Aizo Yamauchi, both of Tsukuba, Japan, assignors to Agency of Industrial Science and Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Mar. 2, 1990, Ser. No. 487,440
Claims priority, application Japan, Mar. 29, 1989, 1-77506; Mar. 29, 1989, 1-77507
Int. Cl.[5] H01B 1/06
U.S. Cl. 252—518 5 Claims

1. An electroconductive copolymer composition consisting essentially of a 3-n-dodecylthiophene-3-methylthiophene electroconductive copolymer and a dopant which is at least one anion selected from the group consisting of hexaflurophosphoric acid ion, hexafluoroarsenic acid ion, tetrafluoroboric

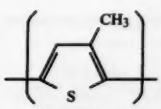


acid ion, perchloric acid ion and trifluoromethanesulfonic acid ion, said copolymer comprising first repeating units represented by the formula (I):



(I)

and second repeating units represented by formula (II):



(II)

having said first and second repeating units randomly and linearly arranged, and said copolymer containing said second repeating units in an amount within the range of 34 to 65 mol%, possessing a weight average molecular weight within the range of 60,000 to 100,000 and being doped with 1 to 50 mol%, based on the total weight of said first and second repeating units, of said dopant.

5,069,824

OXIDES OF THE PYROCHLORE FAMILY AND ELECTRICALLY RESISTANT MATERIALS THAT CONTAIN THEM

Inge Blanke, Bad Laer; Hans-Georg Burckhardt, Frankfurt; Frieder Gora; Karlheinz Guldner, both of Aschaffenburg; Jurgen Dehoust, Hanau; Christina Modes, Darmstadt; Sybille Kemmler-Sack, Tubingen, and Joachim Schmidt, Hanau, all of Fed. Rep. of Germany, assignors to W.C. Heraeus GmbH, Hanau am Main, Fed. Rep. of Germany

Filed Apr. 6, 1990, Ser. No. 505,758
Claims priority, application Fed. Rep. of Germany, May 5, 1989, 3914844
Int. Cl.[5] H01B 1/06
U.S. Cl. 252—518 13 Claims

1. An electrically conductive oxide of the pyrochlore family consisting essentially of (a) at least one of copper and silver, (b) at least one of calcium, strontium, and barium, (c) lead, (d) bismuth, (e) ruthenium, and (f) oxygen of the formula

$$M_xM'_y(Pb,Bi)_{2-x-y}Ru_2O_{7-z}$$

wherein M is at least one of copper and silver, M' is at least one of calcium, strontium, and barium, and $0.2 \leqq x \leqq 0.6$, $0.1 \leqq y \leqq 1.0$, and $0.1 \leqq z \leqq 1.0$.

5,069,825

DETERGENT LAUNDRY BAR WITH IMPROVED FORMULATION AND PROCESS

David P. Joshi, S. Plainfield; P. Ramachandran, W. Windsor, both of N.J., and Zenaida B. Soriano, Alabang, Philippines, assignors to Colgate-Palmolive Company, Piscataway, N.J.

Division of Ser. No. 338,197, Apr. 14, 1989, Pat. No. 5,039,453.
This application Sep. 19, 1990, Ser. No. 588,540
Int. Cl.[5] C11D *1/22, 3/065*
U.S. Cl. 252—533 1 Claim

1. A process for manufacturing a milled and plodded detergent bar characterized by a Dietert hardness of 78–83 and a slow use up rate comprising the steps of:

(a) adding a quantity of a C_9 to C_{18} alkyl benzene sulfonate equal to about 15 to 30 percent by weight of the final bar to a crutcher or amalgamator,

(b) adding a quantity of sodium pyrosulfate equal to about 5 to 10 percent of the weight of the final bar, a quantity of sodium exchanged zeolite equal to about 2 to 2.5 percent by weight of the final bar, and a quantity of magnesium sulfate equal to about 2 to 4 percent by weight of the final bar, to the crutcher or amalgamator,

(c) stirring the resultant mixture to effect partial neutralization,

(d) adding a quantity of sodium carbonate equal to about 10 to 15 percent of the weight of the final bar to the mixture with stirring to complete neutralization of the mixture,

(e) adding a quantity of coco fatty alcohol sulfate equal to about 8 to 15 percent by weight of the final bar and a quantity of sodium silicate equal to about 0.2 to 1.7 percent by weight of the final bar to the mixture,

(f) mixing the ingredients, plodding the mixture thus formed under vacuum,

(g) extruding to form a homogeneous bar.

5,069,826

INFRARED RADIATION ABSORBING BLUE GLASS COMPOSITION

J. Joseph Cheng, Perrysburg, Ohio, assignor to Libbey-Owens-Ford Co., Toledo, Ohio

Division of Ser. No. 418,657, Oct. 10, 1989, Pat. No. 5,013,487, which is a continuation-in-part of Ser. No. 395,550, Aug. 18, 1989, abandoned. This application Sep. 24, 1990, Ser. No. 587,243
Int. Cl.[5] F21V *9/04;* B04B *1/04, 1/08*
U.S. Cl. 252—587 5 Claims

2. A process for producing a blue-colored, infrared radiation absorbing soda-lime silica glass composition, the glass composition comprising:

A) from about 68 to about 74 weight percent SiO_2;

B) from about 11 go about 14 weight percent Na_2O;

C) from about 0 to about 1 weight percent K_2O;

D) from about 1.5 to about 5 weight percent MgO;

E) from about 6 to about 13 weight percent Al_2O_3;

F) from about 0 to 3 weight percent Al_2O_3;

G) from about 0 to about 0.5 weight percent TiO_2;

H) from about 0.3 to about 0.7 weight percent Fe_2O_3;

I) from about 0 to about 0.6 weight percent SnO_2;

J) from about 0.5 to about 1.2 weight percent ZnO; and

K) from about 0.15 to about 0.4 weight percent SO_3--.

the process including the steps of melting and fining batch ingredients to provide the glass composition and casting the same to form a glass product and reheating the product to provide a glazing, the process further including the steps of

A) adding to the batch ingredients an effective iron reducing amount of zinc sulfide as a reducing agent and as an agent to maintain iron in a reduced state;

B) reducing the iron content of the glass composition with the zinc sulfide; and

C) maintaining the reduced content of the iron with the zinc sulfide to provide a glass product and glazing with reduced iron content.

5,069,827

PROCESS FOR REDUCING AND DISSOLVING PUO_2

Xavier Machuron-Mandard, Antony; Charles Madic, Thiais, and Gérard Koehly, Bievres, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 256,048, Oct. 11, 1988, abandoned.
This application Jul. 25, 1990, Ser. No. 560,009
Claims priority, application France, Oct. 13, 1987, 87 14110
Int. Cl.[5] G21F *9/00*
U.S. Cl. 252—626 14 Claims

1. Process for dissolving solid plutonium dioxide, comprising the step of contacting the solid plutonium dioxide with a hydrazine-free, acid aqueous solution containing a reducing agent, whose redox potential is below +0.5 V/ENH to reduce and dissolve the plutonium, the valence of the plutonium being reduced from IV to III, said acid aqueous solution being selected from the group consisting of a sulfuric acid solution and a formic acid solution.

5,069,828

PROCESS FOR PREPARING BENZENESULFONATE SALTS

Donald J. Dumas, and Vinayakam Subramanyam, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 6, 1989, Ser. No. 359,902
Int. Cl.[5] C07C *303/32*
U.S. Cl. 260—402 9 Claims

1. A process for preparing benzenesulfonate salts of the formula (I)

$$RCO_2PhSO_3M \quad (I)$$

where:

R is C_5–C_9 linear alkyl; $CH_2So_2R_3$; or $CH_2OC(O)R_6$

R_3 is C_1–C_{14} alkyl;

R_6 is C_1–C_{20} linear or branched alkyl; and

M is selected from an alkali metal or an alkaline earth metal

by reacting an acid chloride of the formula (II)

$$RCOCl \quad (II)$$

with a phenol sulfonic acid salt of the formula (III)

$$HOPhSO_3M \quad (III)$$

in an inert aprotic solvent having a boiling point above 100° C., the improvement comprising reacting said acid chloride with said phenol sulfonic acid salt in the presence of from 0.1 to 10 mole percent of a phase transfer catalyst selected from quaternary ammonium and quaternary phosphonium salts based on the amount of phenol sulfonic acid salt present in the reaction.

5,069,829

PROCESS FOR REFINING GLYCERIDE OIL USING SILICA HYDROGEL

Josef P. Van Dalen, Maartensdijk, and Leo Brunia, Rotterdam, both of Netherlands, assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Filed Mar. 16, 1990, Ser. No. 495,257
Claims priority, application United Kingdom, Mar. 21, 1989, 8906443
Int. Cl.[5] C09F *5/10;* C11B *3/00*
U.S. Cl. 260—428 11 Claims

1. Process for refining glyceride oil comprising the steps of:

i) contacting the glyceride oil with a silica hydrogel;

ii) removing water from the mixture of glyceride oil and silica hydrogel; and

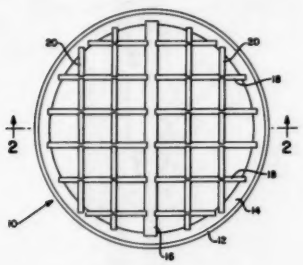
iii) separating the silica hydrogel from the mixture.

5,069,830

NON-WELDED SUPPORT PLATE OR BED LIMITER FOR PACKED TOWERS AND METHOD OF MAKING SAME

Frank D. Moore, Tallmadge, and Michael J. Dolan, Brecksville, both of Ohio, assignors to Norton Company, Worcester, Mass.

Filed Feb. 20, 1990, Ser. No. 481,486
Int. Cl.[5] B01F *3/04*
U.S. Cl. 261—94 24 Claims



1. A plate for a gas and liquid contacting apparatus having permanent internal support members and a bed of packing materials, said plate intended for restraining said bed of packing materials and comprising:

a plurality of first and second support beams;

means for engaging said first support beams with said permanent internal support members without welding; and

means for fastening said first and second support beams rigidly without welding;

each said first support beam being essentially "U" shaped in cross-section with a support ledge portion folded outwardly at the open end of each arm of the "U" and having first and second ends and an intermediate portion therebetween;

each said second support beam being essentially a flat bar having at least one angular bend along the length thereof to form a horizontal surface and at least one vertical surface, and having first and second ends and an intermediate portion therebetween, the horizontal surface of said second support beam being further extended beyond the length of the vertical surface to form an end flap dimensioned, when positioned perpendicular to a first support beam, to rest atop the support ledge of the first support beam and extend into the channel between the arms of the "U" thereon;

said plurality of first support beams being of varying lengths and disposed essentially parallel to each other to engage the permanent internal support members and thereby span the cross sectional area of the contacting apparatus between such permanent internal support members;

said plurality of second support beams being of proper length to span the perpendicular distance between adjacent first support beams and being disposed essentially perpendicular to the plurality of first support beams and essentially parallel to each other, thereby dividing the cross-section of the contacting apparatus into a plurality of open areas.

5,069,831

METHOD FOR SEPARATION OF MICROCAPSULES AND PREPARATION OF PRINTING INKS

Gerhart Schwab, Chillicothe, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Dec. 22, 1988, Ser. No. 288,654
Int. Cl.[5] B01J *13/20;* B41M *3/12*
U.S. Cl. 264—4.33 15 Claims

1. A method for preparing a coating composition containing microcapsules which comprises the steps of:

preparing a slurry of microcapsules containing an ionic or poly emulsifier wherein said emulsifier is characterized in that said emulsifier contains pendant amino, hydroxyl, carboxylic acid, sulfonic acid, or phosphonic acid groups;

after preparing said slurry of microcapsules, adding a de-emulsifier to said slurry wherein said de-emulsifier is a metal salt, a cationic polymer, an anionic polymer, or a non-ionic polymer whereupon said de-emulsifier coulombically interacts with said emulsifier causing said slurry to separate into an aqueous phase and a microcapsule rich phase;

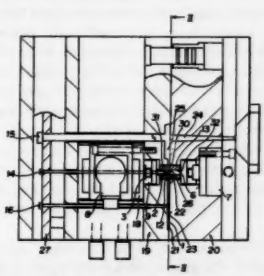
separating said microcapsules from said slurry; and dispersing said microcapsules in a coating vehicle.

5,069,832

DEGATING METHOD

Toshikata Okumura, Toyama; Yukio Nakamura, Kawaguchi; Noriei Yoneoka, Toda, and Syuiti Hachikawa, Toyama, all of Japan, assignors to Kabushiki Kaisha Fujikoshi, Toyama and Nissui Kako Co., Ltd., Kawaguchi, both of, Japan

Filed Oct. 17, 1990, Ser. No. 599,111
Claims priority, application Japan, Oct. 25, 1989, 1-276150
Int. Cl.[5] B06B *3/00;* B29C *35/08, 37/02, 45/38*
U.S. Cl. 264—23 5 Claims



1. A degating method comprising the steps of:

filling a cavity of a mold with molten plastic, the mold having a fixed mold half, a movable mold half, and a gate, the mold halves being provided with holes crossing the gate in an axial direction in which the movable mold half is opened and closed, the holes having a first degating punch and a second punch axially and slidably inserted in respective ones of the holes, movement of the first punch in the axial direction being transmitted to the second punch via the plastic filling the cavity of the mold such that the second punch moves synchronously with the movement of the first punch;

dwelling and cooling the molten plastic at the gate in the mold so as to seal the gate subsequent to the filling step; thereafter

vibrating with high frequency one of the two punches after the gate is sealed during both dwelling subsequent to the filling and the subsequent cooling, so that the vibrational energy softens the plastic around the gate;

the step of vibrating with high frequency including transmitting the vibration of the one of the two punches to the other of the two punches through the plastic filled between the two punches, such that the punches move synchronously to heat and soften the plastic for facilitating degating of the plastic when the two punches are further displaced together to degate the softened plastic; and

displacing the vibrated one punch of the vibrating step when the plastic is softened to degate the plastic.

5,069,833

INJECTION METHOD

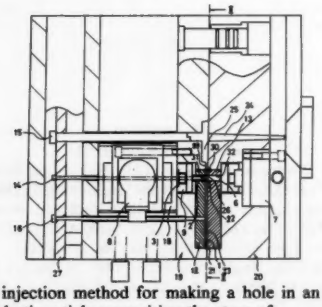
Hidetoshi Yokoi, 2-8-20 Nakamachi, Setagaya-ku, Tokyo; Toshikato Okumura, Toyama; Yukio Nakamura, Kawaguchi; Noriei Yoneoka, Toda, and Syuiti Hachikawa, Toyama, all of Japan, assignors to Hidetoshi Yokoi, Tokyo and Kabushiki Kaisha Fujikoshi, Toyama, both of, Japan

Filed Feb. 13, 1991, Ser. No. 654,185

Claims priority, application Japan, Feb. 23, 1990, 2-040973

Int. Cl.[5] **B06B** *3/00;* **B29C** *35/08, 37/02, 45/38*

U.S. Cl. 264—23 **5 Claims**



1. An injection method for making a hole in an injection molded plastic article comprising the steps of:

filling a cavity of a mold with a molten plastic, the mold having a fixed mold half, a movable mold half, and a gate, the mold halves being provided with bores coinciding with the hole to be made in the article in an axial direction in which the movable mold half is opened and closed, the bores having a first hole-making punch and a second punch axially and slidably inserted in their respective ones of the bores, movement of the first punch in the axial direction being transmitted to the second punch via the plastic filled between the two punches in a manner synchronously with the movement of the first punch;

cooling the molten plastic at the gate in the mold so as to seal the gate;

thereafter vibrating with high frequency one of the two punches after the gate is sealed during both dwelling and the cooling subsequent to dwelling, so that the vibrational energy softens the plastic between the two punches; the step of vibrating with high frequency also including transmitting the vibration of the first punch to the second punch through the plastic filled between the two punches, such that the second punch moves synchronously with the first punch to heat and soften the plastic for making the hole in the plastic when the two punches are further displaced together to make the hole in the softened plastic; and

displacing the vibrated punch when the plastic is softened to make the hole in the plastic of the injection molded plastic article.

5,069,834

METHOD OF MANUFACTURING AN ELECTROMAGNETICALLY ACTUATABLE VALVE

Rudolf Babitzka, Birkenweg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 514,481, Apr. 25, 1990, Pat. No. 4,996,744, which is a division of Ser. No. 362,782, Jun. 7, 1989, Pat. No. 4,944,486. This application Oct. 31, 1990, Ser. No. 606,293

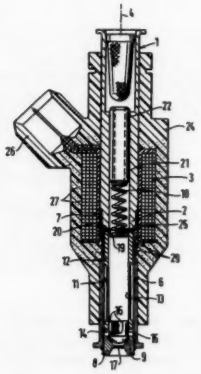
Claims priority, application Fed. Rep. of Germany, Jul. 23, 1988, 3825134

Int. Cl.[5] **H01F** *41/02*

U.S. Cl. 264—24 **2 Claims**

1. A method of encapsulating an electromagnetically operated fuel injection valve for fuel injection systems in a plastic sheath including ferromagnetic fillers so that said ferromagnetic fillers are in an optimum arrangement for electromagnetic field propagation relative to a magnetic coil which comprises molding said plastic sheath about said valve using a plastic resin that includes ferromagnetic fillers in an area surrounding a radially outer surface of said magnetic coil,

mixing ferromagnetic fillers in said plastic resin prior to a setting stage, and



exciting said magnetic coil during the setting stage of said plastic resin so as to align the ferromagnetic fillers in an optimum arrangement surrounding said magnetic coil for electromagnetic field propagation relative to said magnetic coil.

5,069,835

METHOD FOR HIGH FREQUENCY MOLDING OF LIQUID PLASTIC MATERIAL

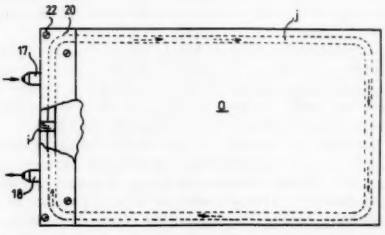
Robert Oriez, Vendome, and Elie Gras, Genay, both of France, assignors to Anver, Maisons-Alfort, France

Division of Ser. No. 347,306, May 4, 1989, Pat. No. 4,954,073. This application Jun. 28, 1990, Ser. No. 545,084

Claims priority, application France, May 4, 1988, 88 05968

Int. Cl.[5] **B29C** *35/08, 45/14*

U.S. Cl. 264—26 **2 Claims**



1. A method of high frequency molding comprising the steps of:

(a) providing a mold including an injection nozzle and a vent nozzle;

(b) placing a part to be overmolded within the mold such that a cavity in the form of a closed loop having a desired profile is defined around the perimeter of the part;

(c) placing a sealing insert in the mold cavity between the nozzles, the sealing insert having a shape corresponding to the mold profile and thereby providing sealing between the nozzles, said insert being made of a material of the same nature as subsequently injected plastic material;

(d) injecting a liquid plastic material under pressure into the mold cavity via the injection nozzle, while simultaneously venting the cavity via the venting nozzle; and then,

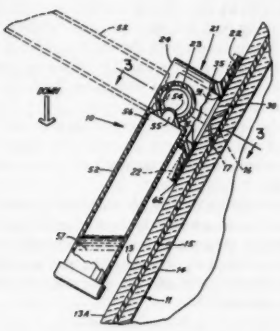
(e) applying a high frequency electric field by an appropriate generator, thereby melting the sealing insert and causing it to weld to the overmolded part to form a continuous gasket around the part.

5,069,836

METHOD OF REPAIRING WINDSHIELD BREAKS

Frank D. Werner, and Richard C. Greig, both of Jackson, Wyo., assignors to Frank D. Werner, Jackson, Wyo.

Filed Jul. 28, 1989, Ser. No. 389,615
Int. Cl.[5] B32B *35/00*
U.S. Cl. 264—36 14 Claims



1. A method of repairing small breaks in laminated windshield glass comprising providing a fixture that has an outlet opening;

applying the fixture to the glass with the outlet opening surrounding the break, and sealingly fixing the fixture to the glass;

providing a reservoir for holding repair resin in its liquid state connected to the outlet opening of the fixture and movable between two positions while connected to the outlet opening;

positioning the reservoir in a first position with respect to the outlet opening to prevent escape of the repair resin held therein into the outlet opening;

evacuating the outlet opening and the break while also evacuating the reservoir such that any gases contained in the resin are at least partially removed by the vacuum;

moving at least a portion of the reservoir to a second position with respect to the outlet opening to permit the resin to drain from the reservoir into the outlet opening and into the break under the influence of gravity and draining the resin into the outlet opening and the break while maintaining the vacuum on the outlet opening, the break, and the resin; and

removing the vacuum to allow atmospheric pressure to force the resin into the break.

5,069,837

METHOD OF FORMING INFLATABLE UPHOLSTERED CUSHION

Joseph A. Sember, III, 2339 Paseo de Cima, and Joseph A. Sember, 2134 Camino San Rafael, both of Glendale, Calif. 91206

Continuation-in-part of Ser. No. 226,664, Aug. 1, 1988, abandoned. This application Mar. 7, 1990, Ser. No. 490,038
Int. Cl.[5] B29C *67/22*
U.S. Cl. 264—45.2 4 Claims

1. A method for forming an upholstered seat cushion, comprising the steps of:

forming a mold of a pair of mold sections such that when the mold is closed, the mold sections enclose a cavity;

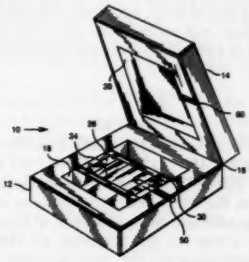
placing a sheet of cushion upholstery material in each of the mold sections such that an inner surface of the sheet faces away from a wall of the mold section containing the sheet;

forming each sheet of cushion upholstery material to have the configuration of corresponding portions of the completed cushion;

mounting an inflatable/deflatable bladder in the mold between the sheets of cushion upholstery material;

inflating the bladder;

injecting chemicals into the mold to form a foam material surrounding the inflated bladder and covered by the upholstery material;



coating the inner surfaces of the sheets of cushion upholstery material with a material that will bond the foam to the upholstery material;

forming one of the mold sections to have a plurality of locator pins therein;

forming the bladder to have a tab portion;

forming a plurality of holes in the tab portion to register with the locator pins;

mounting the bladder on the locator pins such that the pins extend through the holes in the tab portion; and

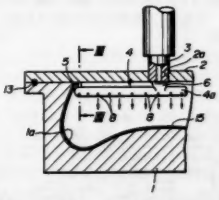
positioning the bladder in a selected position in the mold by using positioning stops on the locator pins to retain the bladder in a predetermined position in the cushion.

5,069,838

METHOD OF PRODUCING FRAME-INSTALLED SEAT PAD STRUCTURE

Masami Mori; Norio Yanagishita; Ichiro Matsuura; Kiichiro Ishimaru, and Hisayoshi Mizuno, all of Kanagawa, Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

Continuation of Ser. No. 277,868, Nov. 30, 1988, abandoned. This application Mar. 28, 1990, Ser. No. 501,965
Claims priority, application Japan, Mar. 30, 1988, 63-74643
Int. Cl.[5] B29C *67/22*
U.S. Cl. 264—46.6 9 Claims



1. A method of producing a seat pad structure which has a frame installed therein, comprising the steps of:

(a) preparing a mold assembly which comprises a mold and a lid, said lid having a foamable material feeding tube connected thereto;

(b) forming said frame as an endless elongate member which defines therein a continuous way and having an inlet portion matable with said feeding tube of said lid and a plurality of outlet portions;

(c) equipping said lid with a plurality of clips for detachably connecting said frame and connecting said frame to said lid by said clips having said inlet portion of said frame mated with said material feeding tube;

(d) putting said lid on said mold having said frame exposed to a cavity of said mold;

(e) charging said material feeding tube with a liquid foamable material for foamed plastic thereby to cause said foamable material to be poured into said cavity of said mold through said outlet portions of said frame and continuing said charging until said cavity is substantially completely filled with said foamable material to form said seat pad structure with said frame installed therein; and

(f) removing said seat pad structure with said frame installed therein from said mold when said foamable material is hardened to a certain degree by detaching said frame from said clips.

5,069,839

PROCESS FOR INCREASING THE FIRING SHRINKAGE OF CERAMIC FILM CASTING MIXTURES

Dieter Grote; Fritz Müller, and Heinz Pavlicek, all of Marktredwitz, Fed. Rep. of Germany, assignors to Hoechst Ceramtec Aktiengesellschaft, Selb, Fed. Rep. of Germany

Continuation of Ser. No. 324,726, Mar. 17, 1989, abandoned.
This application Jan. 31, 1991, Ser. No. 649,321
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1988, 3809350
Int. Cl.[5] C04B *35/64*
U.S. Cl. 264—63 **6 Claims**

1. A process for preparing ceramic substrates, comprising:

(a) preparing a ceramic film casting mixture comprising a ceramic material, a plasticizer, a binder and a solvent selected from the group consisting of methanol, ethanol, isobutyl, alcohol, trichlorethylene, trichloroethane and toluene;

(b) adding to the ceramic film casting mixture at least one high molecular weight mixed ester formed from at least one dicarboxylic acid selected from the group consisting of oxalic acid, malonic acid, adipic acid, sebacic acid and phthalic acid, at least one C_8–C_{24}—fatty acid and at least one polyhydric aliphatic alcohol;

(c) forming a slip of the ceramic film casting mixture on a carrier surface;

(d) drying the slip to a flexible ceramic film; and subsequently

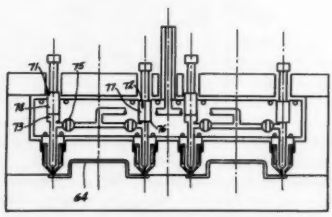
(e) firing the film.

5,069,840

MOLDING PLASTIC ARTICLES

Robin Arnott, Alliston, Canada, assignor to Husky Injection Molding Systems Ltd., Bolton, Canada

Filed Feb. 16, 1990, Ser. No. 480,866
Int. Cl.[5] B29C *45/02, 45/13*
U.S. Cl. 264—69 **7 Claims**



1. Method for forming molded plastic articles in a multi-cavity injection molding system which comprises:

feeding molten plastic from a feeding means to at least two mold cavities via a hot runner channel in a hot runner system and nozzles, wherein at least two nozzles communicate with each mold cavity;

providing at least one shooting pot containing molten plastic communicating with each nozzle and with the mold cavity, wherein the feeding means communicates with the nozzles and shooting pots via the hot runner channel and feeding molten plastic from the feeding means to the shooting pots and the mold cavities via the hot runner channel;

blocking the flow of molten plastic from the feeding means to both the mold cavities and the shooting pots by closing the communication therebetween so that molten plastic cannot flow between the hot runner channel and shooting pots and between the hot runner channel and the mold cavities and so that closed systems are provided between the shooting pots and mold cavities, wherein the shooting pot communication with the mold cavities is provided via separate channels between the shooting pots and mold cavities, and providing entrances from the hot runner channel to the shooting pot-mold cavity communication channels, wherein the blocking step closes the entrance between the hot runner channel and shooting pot-mold cavity communication channels to form said closed system; and

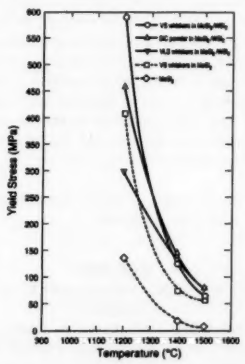
alternately feeding molten plastic from the shooting pots to the mold cavities while the flow of molten plastic between the feeding means and both the shooting pots and mold cavities is blocked, whereby the molten plastic is oscillated in the mold cavities via the closed shooting pot-mold cavity systems.

5,069,841

MOLYBDENUM DISILICIDE ALLOY MATRIX COMPOSITE

John J. Petrovic; Richard E. Honnell, and W. Scott Gibbs, all of Los Alamos, N. Mex., assignors to University of California, Alameda, Calif.

Division of Ser. No. 462,256, Jan. 9, 1990, Pat. No. 4,970,179.
This application Aug. 9, 1990, Ser. No. 564,820
The portion of the term of this patent subsequent to Mar. 19, 2008, has been disclaimed.
Int. Cl.[5] C04B *35/56, 35/58*
U.S. Cl. 264—86 **4 Claims**



1. A method of making a composition of matter consisting of a matrix substance having silicon carbide dispersed throughout it, said matrix substance consisting of molybdenum disilicide and at least one refractory silicide chosen from a group consisting of tungsten disilicide, niobium disilicide, tantalum disilicide, molybdenum trisilicide, tungsten trisilicide, niobium trisilicide, tantalum trisilicide, titanium trisilicide, titanium disilicide, chromium disilicide, zirconium disilicide, yttrium disilicide, and vanadium disilicide, where said matrix substance

consists of from about 50 to about 90 mole percent of molybdenum disilicide, where said silicon carbide is present in an amount of from about 10 to about 30 volume percent, and where said silicon carbide is in the form of submicron powder or VS whiskers or VLS whiskers or a mixture of two or three of three of these forms, said method comprising:

a. mixing molybdenum disilicide powder, at least one of said refractory silicides in powder form, and said silicon carbide to form a substantially homogenous mixture;
b. applying heat to said mixture until a peak temperature of about 1900° C. is reached;
c. applying pressure to said mixture and increasing the pressure on said mixture until a peak pressure of about 30 MPa is reached;
d. holding said mixture at about said peak pressure and about said peak temperature for a time period of from about 5 minutes to about 1 hour to form a coherent shape;
e. decreasing the pressure applied to said coherent shape to atmospheric pressure and cooling said coherent shape to ambient temperature; and
f. recovering said coherent shape.

5,069,842

PROCESS OF SHAPING CARBONACEOUS BLOCKS BY MULTIAXIAL COMPACTING

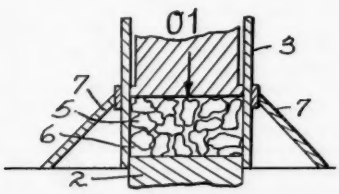
Claude Vanvoren; Benoit Coste, both of St. Jean de Maurienne, and Francois Keime, Meylan, all of France, assignors to Aluminum Pechiney, Paris, France

Division of Ser. No. 501,299, Mar. 30, 1990, Pat. No. 4,990,081, which is a continuation of Ser. No. 303,052, Jan. 27, 1989, abandoned, which is a continuation of Ser. No. 99,781, Sep. 22, 1987, abandoned. This application Oct. 23, 1990, Ser. No. 601,360

Claims priority, application France, Sep. 30, 1986, 86 13779

Int. Cl.[5] B28B *3/00*

U.S. Cl. 264—101 **10 Claims**



1. A process for shaping, by compacting, carbonaceous blocks formed by a carbonaceous paste comprising a carbonaceous aggregate selected from the group consisting of coke, anthracite, and graphite, an organic cokable binder comprising tar and optional additives, comprising the steps of introducing the carbonaceous paste into a mold having walls, at least one of said walls being displaceable with respect to its initial position and successively applying to said paste at least one stress σ_n along an axis A_n, then at least one stress σ_{n+1} along an axis A_{n+1} which is not coincident with the axis A_n, then at least one stress σ_{n+2} along an axis A_{n+2} which is not coincident with the axis A_{n+1}, said stresses being applied repetitively, each stress $\sigma_{(i)}$ being applied after at least partial suppression of the preceding stress $\sigma_{(i-1)}$.

5,069,843

PROCESSING ETHYLENE TEREPHTHALATE/HEXAHYDROTEREPHTHALATE COPOLYMER FILAMENTS

Steven M. Hansen, Kinston, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 29, 1990, Ser. No. 575,109

Int. Cl.[5] D01F *6/84*

U.S. Cl. 264—103 **2 Claims**

1. Process for preparing a tow of crimped fibers of ethylene terephthalate/hexahydroterephthalate copolymer of 80–86 mol % terephthalic acid/20–14 mol % hexahydroterephthalic acid components, said fibers having an elongation of at least 25% with a dry heat shrinkage (measured at 160° C.) of less than 10%, including the steps of melt-spinning said copolymer into filaments, forming a tow from a multiplicity of said filaments, and subjecting said tow to 2 stages of drawing, followed by crimping, and then relaxing by heat-treating the filaments in a tension-less state at a temperature of about 120° to about 145° C. to reduce the shrinkage.

5,069,844

IMPROVEMENTS IN PROCESS FOR PREPARING CRYSTALLINE SPIN-ORIENTED FILAMENTS

Teddy H. Grindstaff, and Cecil E. Reese, both of Kinston, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 228,802, Jul. 28, 1988, abandoned, which is a continuation of Ser. No. 934,215, Nov. 21, 1986, abandoned. This application Oct. 12, 1989, Ser. No. 420,459

The portion of the term of this patent subsequent to Dec. 3, 2008, has been disclaimed.

Int. Cl.[5] D01F *6/62, 11/04*

U.S. Cl. 264—103 **4 Claims**

1. An improvement in a process for preparing a textile yarn consisting essentially of crystalline filaments that are spin-oriented, comprising the steps of melt-spinning and quenching polyester at high withdrawal speed into filaments, treating the freshly-extruded filaments with a spin-finish and collecting them in the form of a bundle, and processing them into a yarn, wherein the improvement consists in treating the freshly-extruded filaments with a spin-finish containing an amount of caustic selected and at a location selected such that, in combination with the withdrawal speed and quenching conditions, the caustic treatment is sufficiently soon so as to modify the surface of the polyester, so as to improve the moisture-wicking properties, after washing, as indicated by the polyester having at least 0.2 surface carboxyl equivalents per million grams of fiber in the textile yarn.

5,069,845

IMPROVEMENTS IN PROCESS FOR PREPARING SPIN-ORIENTED FEED YARNS

Teddy H. Grindstaff, and Cecil E. Reese, both of Kinston, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 228,799, Jul. 28, 1988, abandoned, which is a continuation-in-part of Ser. No. 934,221, Nov. 21, 1986, abandoned. This application Oct. 12, 1989, Ser. No. 420,458

The portion of the term of this patent subsequent to Dec. 3, 2008, has been disclaimed.

Int. Cl.[5] D01F *6/62, 11/04*

U.S. Cl. 264—103 **3 Claims**

1. An improvement in a process for preparing a stable amorphous spin-oriented draw-texturing or other feed yarn, comprising the steps of melt-spinning polyester into filaments that are quenched as they are withdrawn from the spinneret at a high speed termed the withdrawal speed, treating the freshly-extruded filaments with a spin-finish and collecting them in the form of a bundle, and further processing such bundle as a multi-filament feed yarn, with interlacing to improve bundle coherency, the improvement characterized by treating the freshly-extruded filaments with a spin-finish containing an amount of caustic selected and at a location selected such that, in combination with the withdrawal speed and quenching conditions, the caustic treatment is sufficiently soon so as to modify the surface of the polyester, so as to improve the moisture-wicking properties, when washed, as indicated by the polyester having at least 0.2 surface carboxyl equivalents per million grams of drawn fiber.

5,069,846

PROCESS FOR PREPARING DRAWN FILAMENT YARNS

Teddy H. Grindstaff, and Cecil E. Reese, both of Kinston, N.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 228,801, Jul. 28, 1988, abandoned, which is a continuation of Ser. No. 934,219, Nov. 21, 1986, abandoned. This application Oct. 12, 1989, Ser. No. 420,456

Int. Cl.[5] D01F *6/62, 11/04*

U.S. Cl. 264—103 3 Claims

1. An improvement in a process for preparing drawn multifilament yarns, comprising the steps of melt-spinning polyester into filaments that are quenched as they are withdrawn from the spinneret at a speed termed the withdrawal speed, treating the freshly-extruded filaments with a finish, collecting them in the form of a yarn and drawing to increase orientation and crystallinity, to reduce shrinkage, wherein the improvement consists in treating the freshly-extruded filaments with a spin-finish containing an amount of caustic selected and at a location selected such that, in combination with the withdrawal speed and quenching conditions, the caustic treatment is sufficiently soon so as to modify the surface of the polyester, so as to improve the moisture-wicking properties, when washed, as indicated by the polyester having at least 0.2 surface carboxyl equivalents per million grams of drawn fiber.

5,069,847

IMPROVEMENTS IN PROCESS FOR PREPARING SPUN YARNS

Teddy H. Grindstaff, Kinston, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 228,800, Jul. 28, 1988, abandoned, which is a continuation of Ser. No. 934,200, Nov. 21, 1986, abandoned. This application Oct. 12, 1989, Ser. No. 420,457

The portion of the term of this patent subsequent to Dec. 3, 2008, has been disclaimed.

Int. Cl.[5] D01F *6/62, 11/04*

U.S. Cl. 264—103 5 Claims

1. An improvement in a process for preparing textile spun yarns from staple fiber of solid cross-section, comprising the steps of melt-spinning polyester into filaments that are quenched as they are withdrawn from the spinneret at a speed termed the withdrawal speed, treating the freshly-extruded filaments with a spin-finish and collecting them in the form of a bundle, further processing such filaments in the form of a tow, if desired, by drawing and possibly annealing to increase orientation and crystallinity, crimping to produce crimped filaments, converting such crimped filaments to staple fiber and forming a spun yarn therefrom, wherein the improvement consists in treating the freshly-extruded polyester filaments with a spin-finish containing an amount of caustic selected and at a location selected such that, in combination with the withdrawal speed and quenching conditions, the caustic treatment is sufficiently soon so as to modify the surface of the polyester, so as to improve the moisture-wicking properties, after washing, as indicated by the polyester having at least 0.2 surface carboxyl equivalents per million grams of drawn fiber.

5,069,848

EXTRUSION PROCESS OF POLYIMIDE AND POLYIMIDE PELLET USED FOR THE PROCESS

Masumi Saruwatari, Nagoya; Syoichi Tsuji, Tanashi, and Yasuhiro Fujii, Nagoya, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

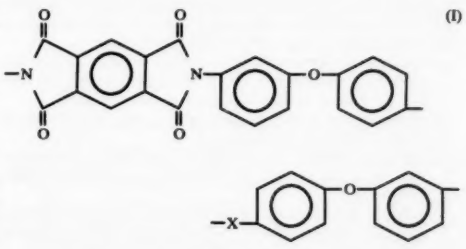
Filed Mar. 26, 1990, Ser. No. 498,975

Claims priority, application Japan, Apr. 5, 1989, 1-84889

Int. Cl.[5] B29C *47/78, 67/24*

U.S. Cl. 264—118 3 Claims

1. A process for extruding polyimide comprising the steps of pelletizing a polyimide consisting essentially of recurring structural units represented by the formula (I)



(I)

wherein X is a single bond or a hexafluoroisopropylidene group, conducting heat-treatment of the resulting pellets to obtain a crystalline polyimide having a crystallinity of 5% or more and feeding the crystalline polyimide pellets to an extruder.

5,069,849

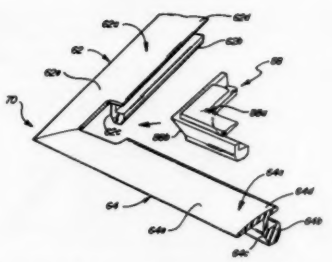
METHOD FOR FORMING A MOLDING

Peter L. Wain, 16079 Forest, East Detroit, Mich. 48021

Filed Feb. 7, 1990, Ser. No. 476,971

Int. Cl.[5] B29C *47/08, 45/14, 65/70*

U.S. Cl. 264—148 2 Claims



1. A method of forming a plastic edge molding comprising the steps of:

extruding a plastic material to form first and second linear plastic molding members each having a complex cross-sectional configuration including first and second flange portions and a web portion interconnecting said flange portions and coacting with said flange portions to form a channel;

removing at least part of one flange portion, the web portion, and at least part of the other flange portion of each molding member proximate one end thereof;

placing said linear members in a mold in angular disposition relative to each other with said one end of said first member juxtaposed within the mold to said one end of said second member and with the juxtaposed ends and the mold coacting to define a mold cavity between the juxtaposed ends, said mold cavity having a configuration similar to the removed portions; and

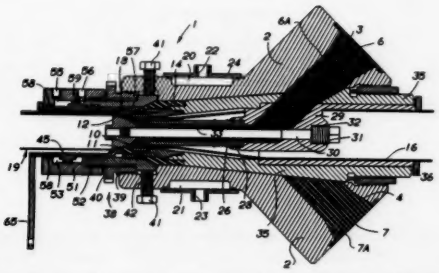
injecting a plastic material into said mold cavity to form a molded corner structure interconnecting said linear members, said molded corner structure replacing the removed portions while adding reinforcing material to regions of the corner structure to provide a rounded portion between the members.

5,069,850

COEXTRUSION APPARATUS AND METHOD USING A RIGID DIE FOR VARYING THE OUTER PROFILE OF A TUBULAR EXTRUDATE

Dale A. Tompkins, Akron, and Richard W. Sicka, Brecksville, both of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Jul. 24, 1990, Ser. No. 557,378
Int. Cl.[5] B29C *47/22*
U.S. Cl. 264—167 20 Claims



1. Coextrusion apparatus for varying the outer profile of a generally tubular extrudate, including die means for forming inner and outer annular extrusion orifices for forming the tubular extrudate, said die means having an axially moveable annular outer die ring and an inner die member for adjustably forming the outer extrusion orifice therebetween, said outer die ring having a central axis coinciding with a central axis of the tubular extrudate; first means for forming an outer flow channel for delivering a first stream of elastomeric material to the outer extrusion orifice of the die means to form an outer layer of the tubular extrudate; second means for forming an inner flow channel for delivering a second stream of elastomeric material to the inner extrusion orifice of the die means to form an inner layer of the tubular extrudate; said outer die ring having first and second annular surfaces, said first surface being conical and tapered to generally match a tapered conical surface on the inner die member and spaced generally concentrically therewith and forms the outer extrusion orifice therebetween, said first surface of the outer die ring and the tapered surface of the inner die member converging toward the central axis in an upstream direction with respect to the movement of the tubular extrudate with said second annular surface communicating with the outer flow channel and forming an expansion chamber within the other flow channel with the volume of said expansion chamber varying in direct relationship to the change in volume of the outer extrusion orifice upon movement of the die ring to maintain a generally constant pressure within the stream of elastomeric material passing through the outer extrusion orifice, and third means for axially moving the outer die ring with respect to the inner die member to change the spacing therebetween to change the amount of elastomeric material passing through said outer orifice to vary the profile of said outer layer with the axially movement of the second annular surface in coordination with that of the first annular surface changing the size of the outer flow channel in relationship to the changing size of the outer extrusion orifice to control the pressure the first stream of elastomeric material moving through outer orifice and forming the outer layer of the tube extrudate.

16. A method for varying the outer profile of a generally tubular extrudate during the formation of said extrudate, including the step of:

a) producing an outer independently controlled annular hollow stream of elastomeric material moving axially within an extrusion head;

b) producing an inner stream of elastomeric material within said coextrusion head which merges with the outer stream to form the generally tubular extrudate;

c) forming an annular outer extrusion orifice through which the outer stream of elastomeric material moves to form the tubular extrudate by providing an axially moveable rigid outer die ring having a pair of tapered surfaces, one of which forms a part of the outer extrusion orifice;

d) axially moving the outer die ring to vary the size of the extrusion orifice by movement of said one of the tapered surface as the elastomeric material is moving through said extrusion orifice to vary the amount of elastomeric material moving through said orifice from the outer stream to vary the outer profile of the extrudate; and

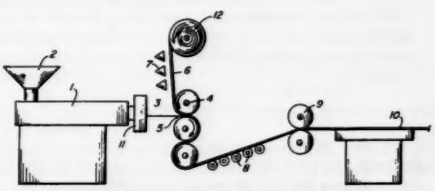
e) simultaneously compensating for a change in pressure within the outer stream of elastomeric material caused by varying the flow volume of said outer stream by the movement of the said one tapered surface at a location generally adjacent the location of application of said outer stream on the outer surface of the tubular extrudate, by the movement of said other tapered surface within said outer stream.

5,069,851

ABS/ACRYLIC LAMINATION PROCESS

Clark T. Hicks, Campbell County, Ky.; Ray D. Hoffman, Westmoreland County, and James E. Thompson, II, Plum Borough, both of Pa., assignors to Aristech Chemical Corporation, Pittsburgh, Pa.

Filed Jul. 9, 1990, Ser. No. 549,874
Int. Cl.[5] B29C *47/90*
U.S. Cl. 264—171 8 Claims



1. Method of making an ABS acrylic laminate comprising (a) passing a lightly cross-linked acrylic sheet having a thickness about 0.1 inch to about 0.250 inch into a roll stack, (b) co-feeding into the roll stack an ABS web about 0.1 to about 0.4 inch thick heated to about 450° F. to about 550° F., wherein the acrylonitrile content of the styrene-acrylonitrile component is about 10% to about 33% by weight, from an extruder to achieve intimate contact between the ABS and the acrylic sheet, and (c) cooling and compressing the co-fed sheets between rolls under compression.

5,069,852

METHOD AND DEVICE FOR THE MANUFACTURE OF A SEALING GASKET ON THE RIM OF A SHEET OF GLASS

Massimo Leone, and Ciro Paudice, both of Vasto, Italy, assignors to Societá Italiana Vetro - SIV - S.p.A., San Salvo CH, Italy

Filed Nov. 8, 1989, Ser. No. 433,204
Claims priority, application Italy, Nov. 9, 1988, 48540 A/88
Int. Cl.[5] B29C *47/02*
U.S. Cl. 264—171 2 Claims

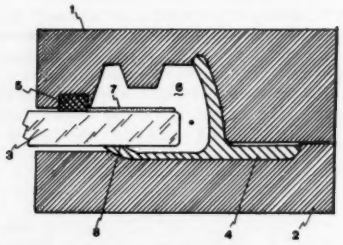
1. A method for the manufacture of a sealing gasket on the edge of a fixed glazing of a vehicle having a surface to be exposed to the outside environment, comprising:

providing a prefabricated sealing gasket made from a material compatible with polyurethane and adapted to be exposed to the outside environment, said sealing gasket having a surface to be exposed to the outside environment on one side and an inner surface on the other side, said

inner surface including a sealing edge the surface of which is capable of sealing on the surface of said sheet of glass;

placing said prefabricated sealing gasket in a half-mold such that said inner surface of the prefabricated sealing gasket defines a surface of a molding cavity;

placing an edge of said sheet of glass in contact with said prefabricated sealing gasket at said sealing edge thereof, such that said edge of said sheet of glass projects into said molding cavity and additionally defines said molding cavity together with said inner surface of the prefabricated sealing gasket; and



extruding a polymerizable polyurethane material on said molding cavity under polymerizing conditions from an extrusion nozzle, said extrusion nozzle sliding along said molding cavity and having a cross-sectional configuration such as to provide a seam of a desired cross-sectional shape to obtain a finished sealing gasket comprising said prefabricated sealing gasket and said seam of polymerized polyurethane material, said seam being bonded to said prefabricated sealing gasket and to said sheet of glass, and said seam embedding the projecting edge of said sheet of glass.

5,069,853

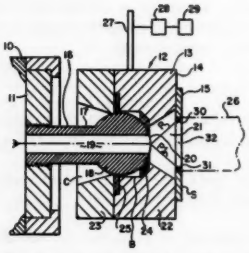
METHOD OF CONFIGURING EXTRUDATE FLOWING FROM AN EXTRUDER DIE ASSEMBLY

William H. Miller, Wadsworth, Ohio, assignor to GenCorp Inc., Fairlawn, Ohio

Division of Ser. No. 207,838, Jun. 17, 1988, Pat. No. 4,906,171. This application Feb. 14, 1990, Ser. No. 479,797

Int. Cl.[5] B29C *47/24, 47/22*

U.S. Cl. 264—176.1 **6 Claims**



1. A method of bending an extrudate exiting an opening in a die comprising:

a) channeling the flow of extrudate from an extruder through the die, mounted on the extruder, via a flow channel of the die and the opening in he die; and

b) rotating the opening in the die with respect to a feed opening to the flow channel to vary the length of the flow channel and pathways along which extrudate flows thereby variably bending the extrudate as the extrudate exits the opening in the die.

5,069,854

ALUMINA FIBER WITH CARBON INCLUSION AND A METHOD OF PRODUCING THE SAME

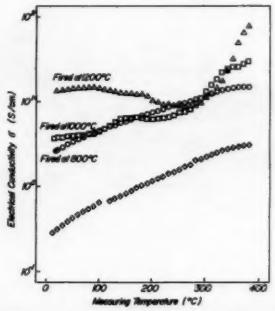
Toshio Kitao, Kyoto; Yoshiharu Kimura, Ohmihachiman; Hideki Yamane, Kyoto, and Koichi Hashimoto, Osaka, all of Japan, assignors to Kyoto Institute of Technology, Kyoto, Japan

Filed Mar. 1, 1989, Ser. No. 317,490

Claims priority, application Japan, Aug. 3, 1988, 63-192792

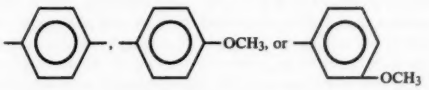
Int. Cl.[5] D01F *6/00*

U.S. Cl. 264—205 **7 Claims**



1. A method of producing an electrically conductive alumina fiber, which comprises pyrolyzing a fiber of poly[-(acyloxy)aloxane] having the formula

wherein R_1 represents $CH_2CH_2OCH_2CH_3$ and R_2 represents



in an inert atmosphere, said fiber being obtained by a dry spinning method, and said pyrolyzing being effected at a temperature sufficient to convert said fiber of poly[(acyloxy)aloxane] to said electrically conductive alumina fiber.

5,069,855

PROCESS FOR PREPARING ROLLED HEAT-TREATED FILMS OR SHEETS

Hiroshi Takasu; Susumu Arase; Junichiro Yokota, all of Chiba, and Kazuo Nakayama, Ibaragi, all of Japan, assignors to Chisso Corporation and Agency of Industrial Science and Technology, both of, Japan

Filed Aug. 17, 1989, Ser. No. 395,435

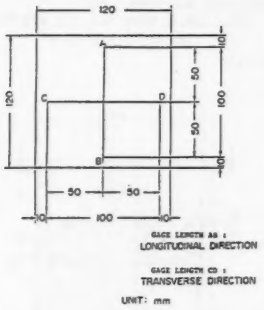
Claims priority, application Japan, Aug. 18, 1988, 63-203747

Int. Cl.[5] B29C *71/02*

U.S. Cl. 264—235 **9 Claims**

1. A process for preparing rolled heat-treated films or sheets which comprises the steps of rolling a crystalline thermoplastic resin material between at least one pair of rolls at a temperature which is lower than the melting point of said resin material but higher than room temperature, and then subjecting said resin material to a heat treatment at a temperature which is higher than the rolling temperature but lower than the melting point

of said resin material, said heat treatment being carried out for a time (t: seconds) satisfying the equation



$$\frac{0.641 \times d \times r \times (Tm - Ta)}{(Ta - Tr)^{0.5}} \leqq t \leqq 120$$

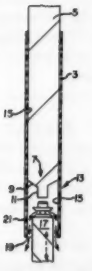
wherein d is the thickness (mm) of said rolled films or sheets, r is the thickness reduction of said rolled films or sheets, Tr is the rolling temperature (°C), Ta is the heat treatment temperature (°C), and Tm is the melting point (C) of said crystalline resin.

5,069,856

METHOD OF FORMING A HEADED THERMOPLASTIC TUBE

George H. Holoubek, and John J. Rhoades, both of Muscatine, Iowa, assignors to Courtaulds Packaging Inc., Wheeling, W. Va.

Filed Sep. 12, 1990, Ser. No. 581,460
Int. Cl.[5] B29C *43/02, 61/02, 61/08*
U.S. Cl. 264—519 **11 Claims**



1. A method of forming a headed thermoplastic tube from an extruded cylinder of thermoplastic material have a continuous wall with inner and outer wall surfaces comprising:

positioning a thermoplastic extruded, longitudinally stretched, cylinder over a forming mandrel having a head forming end, with an exposed portion of said thermoplastic cylinder, having an open end, extending beyond said head forming end;

heating the inner wall surface of the exposed portion of the thermoplastic extruded, longitudinally stretched, cylinder, by use of a heat source inserted into the open end of said exposed portion of said thermoplastic cylinder, to a temperature above the glass transition temperature of said thermoplastic material, while maintaining the outer surface thereof below said temperature so as to provide support for said exposed portion, such that the heated exposed portion of said thermoplastic, extruded, longitudinally stretched cylinder is shaped into a conical shape by said heating which causes longitudinal shrinking and thickening of the wall of said heated exposed portion; and

applying pressure to the conical shaped exposed portion of said thermoplastic cylinder to form a headed thermoplastic tube.

5,069,857

PROCESS FOR THE PRODUCTION OF MOLDED ARTICLES BY DEEP-DRAWING PREFABRICATED POLYURETHANE(UREA) PARTS OR BY PRESSING FRAGMENTED POLYURETHANE(UREA) MATERIAL

Joachim Wagner, Cologne; Thomas Elsner, Duesseldorf; Werner Rasshofer, Cologne; Jürgen Faehndrich, Leverkusen, and Eberhard Jürgens, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Bayerwerk, Fed. Rep. of Germany

Filed Oct. 29, 1990, Ser. No. 605,600
Claims priority, application Fed. Rep. of Germany, Nov. 1, 1989, 3936294; Sep. 25, 1990, 4030282
Int. Cl.[5] B29C *51/42*
U.S. Cl. 264—544 **3 Claims**

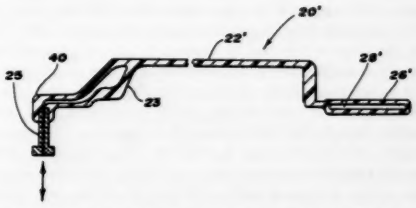
1. In a process for the production of molded articles by deep-drawing a prefabricated polyurethane(urea) part or by pressing a fragmented polyurethane(urea) material produced from a polyisocyanate polyaddition product having a specific gravity of at least 0.8 g/cm^3, wherein said part is placed inside a deep-drawing mold or the fragmented material is introduced into a pressing mold and pressed at a temperature of up to 230° C. and a pressure of up to 1000 bar, the improvement wherein said part is subjected after the deep-drawing or pressing process to a dwell time of at least 10 seconds at a pressure of up to 1000 bar while maintaining the temperature and is immediately thereafter removed from the mold.

5,069,858

METHOD FOR THE USE OF GAS ASSISTANCE IN THE MOLDING OF PLASTIC ARTICLES

James W. Hendry, Brooksville, Fla., assignor to Milad Limited Partnership, Naples, Fla.

Continuation-in-part of Ser. No. 408,921, Sep. 18, 1989, Pat. No. 4,948,547. This application Jul. 16, 1990, Ser. No. 552,871
Int. Cl.[5] B29C *45/00, 45/38;* B29D *22/00*
U.S. Cl. 264—572 **10 Claims**



1. The method for injection molding of a plastic article in an injection molding system including a mold having an injection aperture, an article-defining cavity and a resin reservoir in communication with the cavity, the method comprising the steps of:

injecting an amount of molten plastic resin sufficient for the preparation of the plastic article through the injection aperture and along a first resin flow path which extends from the injection aperture to the article-defining cavity and along a second resin flow path which extends from the article-defining cavity to the resin reservoir;

injecting a first charge of pressurized gas into the mold, said first charge being of pressure and quantity sufficient to enter into the first resin flow path, but not into the article-defining cavity;

injecting a second charge of pressurized gas into the resin

reservoir, said second charge of gas being of pressure and quantity sufficient to enter the second resin flow path and thence into the article-defining cavity but not into the first resin flow path;

maintaining the first and second gas charges under pressure in the mold during the solidification of the plastic resin within the article-defining cavity, thereby completing the formation of the plastic article; and

relieving the gas pressure within the first resin flow path, and within the article-defining cavity preparatory to removing the plastic article from the mold.

5,069,859

METHOD OF INJECTION MOLDING WITH PRESSURIZED-FLUID ASSIST

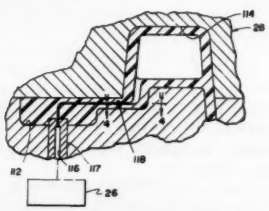
Norman S. Loren, Warren, Mich., assignor to Milad Limited Partnership, Naples, Fla.

Continuation of Ser. No. 133,900, Feb. 16, 1987, abandoned. This application May 10, 1989, Ser. No. 351,271

The portion of the term of this patent subsequent to Jul. 2, 2008, has been disclaimed.

Int. Cl.[5] B29C *45/00*; B29D *22/00*

U.S. Cl. 264—572 **1 Claim**



1. A method for making a hollow-shaped article from a plastic resin having a softening point in a fluid-assisted injection molding system including a source of pressurized fluid and a mold having an injection aperture, an article-defining cavity and a resin reservoir in communication with the cavity and located remote from the injection aperture, the method including the steps of injecting an amount of molten resin sufficient for preparation of the article from an injection nozzle through the injection aperture, along a resin flow path and into the cavity in the mold; communicating pressurized fluid to the molten resin in the cavity through at least one fluid aperture remote from the injection aperture to at least partially distribute the resin over interior surfaces defining the cavity whereby the article is formed within the cavity; cooling the hollow-shaped article so formed to a temperature beneath the softening point of the resin; relieving the pressure within the hollow-shaped article; and opening the mold to remove the hollow-shaped article, wherein the improvement comprises:

displacing a portion of the molten resin from the article-defining cavity to the resin reservoir by the introduction of molten resin into the cavity during the step of injecting so that the resin at least partially fills the resin reservoir, communicating pressurized fluid into the molten resin in the resin reservoir at a point spaced from an interior surface of the resin reservoir through the at least one fluid aperture and wherein the pressurized fluid in the resin reservoir at least partially urges the resin in the resin reservoir toward interior surfaces of the mold defining the resin reservoir and toward interior surfaces of the mold defining the cavity.

5,069,860

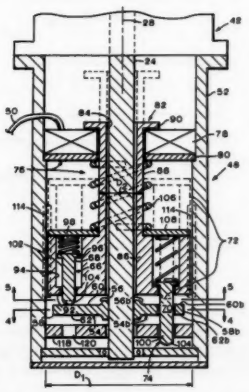
ROTARY LOCK FOR A CONTROL ROD DRIVE

Charles W. Dillmann, Morgan Hill, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Jul. 6, 1990, Ser. No. 548,793

Int. Cl.[5] G21C *7/14*

U.S. Cl. 376—235 **20 Claims**



1. A rotary lock for preventing rotation of a shaft of a control rod drive comprising:

a stationary housing for receiving said shaft;

an arm having a proximal end fixedly joined to said shaft in said housing, a distal end extending radially outwardly from said shaft, a top surface, and a side surface;

a pin having a proximal portion joined to said housing for circumferential restraint relative to said shaft, an intermediate portion, and a distal portion, said pin being positioned in a withdrawn position away from said arm top surface for allowing said arm to rotate with said shaft without obstruction from said pin, and in a deployed position for allowing said pin intermediate portion to contact said arm side surface at said arm distal end for preventing rotation of said arm and said shaft; and

means for selectively positioning said pin in said withdrawn and deployed positions.

5,069,861

APPARATUS FOR THE REMOTE UNSCREWING AND EXTRACTION OF AN ASSEMBLY SCREW

Francis Lagarrigue, Sainte-Foy-les-Lyon, France, assignor to Framatome, Courbevoie and Cogema, Velizy Villacoublay, both of, France

Filed Nov. 15, 1989, Ser. No. 436,984

Claims priority, application France, Nov. 16, 1988, 88 14890

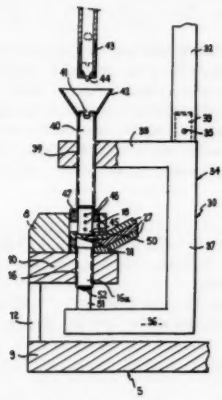
Int. Cl.[5] G21C *19/32*

U.S. Cl. 376—260 **8 Claims**

1. Apparatus for the remote unscrewing and extraction of a fastening screw of an element of a fuel assembly (1) of a nuclear reactor, the head of which is damaged, the screw being engaged by means of its head part (16*b*) in a bore (18) of a first piece (8) of the assembly (1) and by means of its threaded body (16*a*) in an internally threaded bore passing through a second piece (10), this apparatus comprising a C-shaped frame (34) having two branches (35, 36) substantially parallel to one another and a joining part (37) between the two branches (35) and (36), an extraction screw (40, 40', 40'') engaged in an internally threaded hole passing through one branch of the frame (34) and having one end (50) forming a punch directed towards the inside of the frame (34), and a bearing and centring piece (51), the diameter of which is smaller than the diameter of the internally threaded bore of the second piece (10) and which is fastened to the second branch (36) of the frame (34)

and is directed towards the inside of the frame in the axial direction of the extraction screw (40, 40', 40''), characterized in that it also possesses:

a pole (32) to the end of which the C-shaped frame (34) is fastened,



a ring (47) for centring the extraction screw (40) relative to the screw to be extracted (16), arranged round the extraction screw (40) over a smooth part (45) of this screw located between its threaded part and its end part (50) forming the punch,

and a means (43) for the remote actuation of the extraction screw (40, 40', 40'') by screwing or unscrewing.

5,069,862

APPARATUS FOR HANDLING A MACHINE FOR THE TENSIONING OF SCREWED CONNECTING ELEMENTS

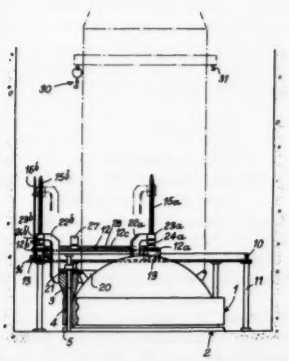
Alain Frizot, Montcenis, France, assignor to Framatome, Courbevoie, France

Filed Sep. 27, 1989, Ser. No. 414,159

Claims priority, application France, Sep. 27, 1988, 88 12603

Int. Cl.[5] G21C *19/00*

U.S. Cl. 376—260 **8 Claims**



1. Apparatus for handling a machine for the simultaneous tensioning of a plurality vertically disposed screwed connecting elements (3) for fastening a cover (1) of a pressurized vessel (2), said apparatus comprising a tensioning module (20) for said connecting elements (3), means (10, 11, 12) for moving said tensioning module (20) in a horizontal plane, and means (15, 22, 24) for moving said tensioning module (20) along a vertical axis of said connecting elements (3), wherein said means for moving said tensioning module (20) in a horizontal plane comprise assembled modular elements forming a rolling track (10) on which travels a train (12) supporting said tensioning module.

5,069,863

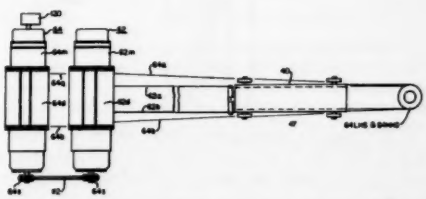
DUAL WINCH NUCLEAR FUEL TRANSFER SYSTEM PROVIDING MORE RELIABLE FUEL TRANSFER DURING REFUELING OPERATIONS

Robert E. Meuschke; Mark J. Harper, both of Murrysville, and David J. Stefko, Penn Township, Westmoreland County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 10, 1989, Ser. No. 377,875

Int. Cl.[5] G21C *19/20*

U.S. Cl. 376—270 **18 Claims**



1. In a nuclear power plant having an auxiliary building, a containment building having the wall, a track extending through a transfer tube within the containment wall, and a fuel transfer system for moving fuel assemblies along the track between the auxiliary building side and the containment building side of the containment wall, said system comprising:

a car having wheels for movement along spaced rails of the track and further having a carrying basket for one or more fuel assemblies;

winch means located on the auxiliary building side of the containment wall and above the water level existing over the track during refueling operations to drive said car along the track;

first cable means and second cable means extending substantially vertically downward from said winch means to the track level;

first sheave means for directing said first and said second cable means substantially in the horizontal direction along the track;

means for securing said first cable means to said car so that winch pulling force on said first cable means drives said car away from the containment building;

second sheave means located near the containment end of the transfer tube;

said second cable means extending substantially horizontally along the track from said first sheave means to said second sheave means where it is redirected to extend substantially horizontally in the reverse direction along the track;

means for securing said second cable means to said car so that winch pulling force on said second cable means drives said car toward the containment building; and

means for operating said winch means to pull said cable means so as to move said car selectively between one end position in which said car is within the auxiliary building for fuel assembly loading and unloading and the other end position in which said car is principally located in the containment building with at least a cable securance portion of said car located over the track within the transfer tube and to the auxiliary building side of said second sheave means; and

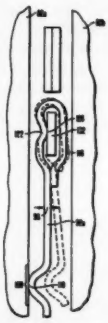
both of said cable securing means located on said cable securance car portion.

5,069,864

NUCLEAR FUEL ASSEMBLY SPACER AND SPRING

Eric B. Johansson, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Apr. 16, 1990, Ser. No. 509,457
Int. Cl.[5] G21C *3/34*
U.S. Cl. 376—441 20 Claims



1. A spring for positioning at least one of a plurality or nuclear fuel rods in a spacer usable in a fuel assembly of a nuclear power plant, the spacer provided with a plurality of ferrules, each ferrule having rod-contacting portions for holding at least one of said rods when said rod is biased against said rod-contacting portions by the spring, the spring comprising:

a metallic strip having a width and a thickness, and having first and second ends, said ends spaced apart, said strip formed to include:

a central region having a rod-contacting portion;

a first spacer-engagement loop formed adjacent to said first end;

a first dimple formed in said first loop, extending towards the interior of said first loop;

a second spacer-engagement loop formed adjacent to said second end;

a second dimple formed in said second loop, extending towards the interior of said second loop; and

a first leg lying between the central rod contacting portion and the first loop; and

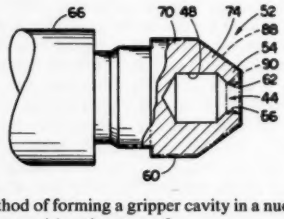
a second leg lying between the central rod contacting portion and the second loop.

5,069,865

METHOD OF FORMING A GRIPPER CAVITY IN A FUEL ROD END PLUG

Denis Yeo, and David A. Boatwright, both of Columbia, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 14, 1990, Ser. No. 627,275
Int. Cl.[5] G21C *3/10*
U.S. Cl. 376—451 16 Claims



1. A method of forming a gripper cavity in a nuclear fuel rod end plug, comprising the steps of:

(a) providing an end plug blank having an internal bore of substantially uniform diameter that opens at an annular outer rim on said end plug blank;

(b) cold forming said end plug blank to produce an intermediate end plug in which said annular outer rim is transformed into a conical outer rim having an internal surface rounded with respect to a circumferential center point about the base axis that defines an inlet opening to said internal bore of a diameter less than that of said internal bore; and

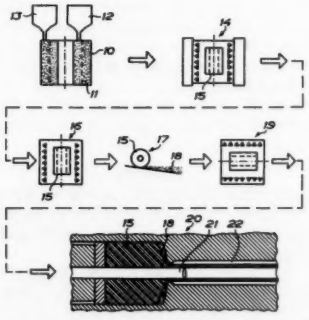
(c) removing an external layer of material from said intermediate end plug and an internal layer of material from said rounded internal surface of said conical outer rim to produce a finished end plug having an internal gripper cavity composed of said internal bore and a cylindrical internal surface defining said inlet opening to said internal bore and being of smaller diameter than said internal bore.

5,069,866

METHOD FOR MANUFACTURING A COMPOUND PIPE

Ragnar Ekbom, Finspång, Sweden, assignor to ABB Stal AB, Finspång, Sweden

Filed May 31, 1990, Ser. No. 531,259
Claims priority, application Sweden, Jun. 1, 1989, 8901984
Int. Cl.[5] B22F *7/00*
U.S. Cl. 419—6 6 Claims



1. Method of preparing a compound pipe, the wall of which comprises an inner layer of a first material and an outer layer of a second material, comprising the steps of hot pressing isostatically powders of the two materials to form a cylindrical tubular blank wherein the first material forms an inner layer and the second material forms an outer layer, heating the blank to a suitable temperature, and extruding the heated blank over a mandrel.

5,069,867

PROCESS OF MANUFACTURING HIGH-STRENGTH SINTERED MEMBERS

Osman Z. Zengin, Gmunden, Austria, assignor to Miba Sintermetall Aktiengesellschaft, Laakirchen, Austria

Filed Feb. 19, 1991, Ser. No. 657,327
Claims priority, application Austria, Feb. 22, 1990, 407/90
Int. Cl.[5] G22F *1/00*
U.S. Cl. 419—15 18 Claims

1. In a process of manufacturing a high-strength sintered member, comprising

providing a carbon-containing powder mixture comprising an iron alloy powder, which contains at least one carbide-forming alloying element of group VIb of the periodic system,

compacting said powder mixture to form a compact, and

subjecting said compact to liquid-phase sintering, the improvement residing in that

said powder mixture is provided to comprise an iron alloy powder containing at least one carbide-forming alloying

element selected from the group consisting of chromium in an amount of 13 to 18% by weight, molybdenum in an amount of 3 to 6% by weight, molybdenum and tungsten in a total amount which is equivalent to 3 to 6% by weight molybdenum, and a combination of at least two of said alloying elements in corresponding proportions, based on the total weight of the powder mixture,

said powder mixture also contains 0.4 to 1.0% by weight phosphorus and at least one additional component powder including 1.5 to 2.6% by weight added carbon powder,

said iron alloy powder is produced in that a molten alloy iron alloy is atomized in an entraining fluid jet and

said at least one additional component powder is subsequently admixed to said iron alloy powder thus produced.

5,069,868

METHOD FOR PRODUCING THERMOELECTRIC ELEMENTS

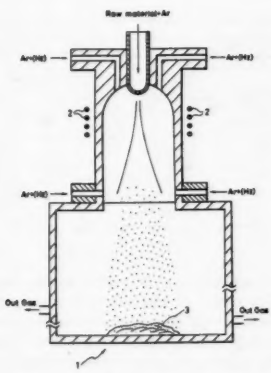
Takeo Tokiai, and Takashi Uesugi, both of Sodegaura, Japan, assignors to Idemitsu Petrolchemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 327,572, Mar. 23, 1989, Pat. No. 4,992,235. This application Nov. 29, 1990, Ser. No. 619,339

Claims priority, application Japan, Mar. 30, 1988, 63-78454; Jul. 15, 1988, 63-177795; Jul. 15, 1988, 63-177796

Int. Cl.[5] B22F *1/00*

U.S. Cl. 419—23 **3 Claims**



1. A method for producing thermoelectric elements comprising molding powders of metal alloy as the raw material and then sintering, wherein said powders of metal alloy are ultra fine powders containing Fe and Si as main components and having a mean particle diameter of 50 to 5,000 Å obtained by subjecting the metal alloy to plasma treatment.

5,069,869

PROCESS FOR DIRECT SHAPING AND OPTIMIZATION OF THE MECHANICAL CHARACTERISTICS OF PENETRATING PROJECTILES OF HIGH-DENSITY TUNGSTEN ALLOY

Jean-Claude Nicolas, Lyon, and Raymond Saulnier, Bonneville, both of France, assignors to Cime Bocuze, Courbevoie, France

Continuation of Ser. No. 626,232, Dec. 11, 1990, abandoned, which is a continuation of Ser. No. 370,188, Jun. 22, 1989, abandoned. This application May 3, 1991, Ser. No. 697,500

Claims priority, application France, Jun. 22, 1988, 88 08888

Int. Cl.[5] B22F *3/24*

U.S. Cl. 419—28 **6 Claims**

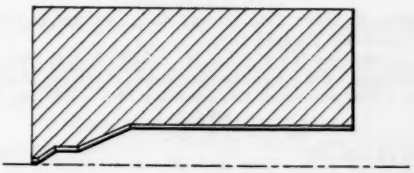
1. In a process for making penetrating projectiles useful in the manufacture of military ammunition, the steps consisting essentially of:

preparing a homogeneous alloy of tungsten, nickel and a metal selected from the group consisting of iron and copper by powder metallurgy;

compacting the alloy mass into a rough shaped blank having an axis of revolution;

sintering the rough shaped blank thereby producing a blank having a density of at least 17,000 kg/m^3; and without machining;

work-hardening in a rotary hammering operation, the sintered blank at a temperature ranging from ambient temperature to 500° C., according to the profile defined by the shape of the desired projectile, thereby directly producing, without final machining, the desired projectile having a degree of reduction varying from 5% to 60% in section, and a diameter essentially variable, in a direction parallel to the axis of said projectile, the travel of the hammers being controlled so that the dimensions of the penetrator with regard to diameter have a tolerance of ±0.05 mm.



5,069,870

HIGH-STRENGTH HIGH-CR STEEL WITH EXCELLENT TOUGHNESS AND OXIDATION RESISTANCE

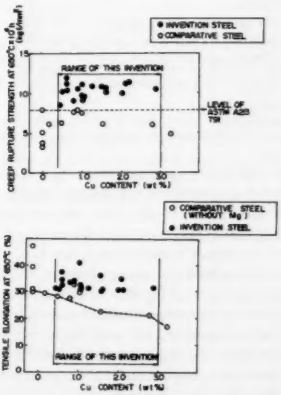
Atsuro Iseda, Kobe, and Yoshiatsu Sawaragi, Nishinomiya, both of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Mar. 6, 1990, Ser. No. 489,012

Claims priority, application Japan, Mar. 6, 1989, 1-53232

Int. Cl.[5] C21D *6/00*

U.S. Cl. 420—70 **25 Claims**



1. A high-strength high-Cr steel with excellent high-temperature strength and toughness as well as improved resistance to oxidation and high-temperature corrosion, which consists essentially of, in weight %:

C: 0.004–0.2%, Si: not greater than 0.7%,

Mn: 0.1–1.5%, Ni: not greater than 1%,

Cr:8–14%, Mo: 0.01–1.2%,

W: 0.8–3.5%, V: 0.1–0.3%,

Nb: 0.01–0.2%, Al: not greater than 0.05%,

Cu: 0.4–3%, Mg: 0.0005–0.5%,
N: 0.001–0.1%
B: 0–0.02%,
at least one of La, Ce, Y, Ca, Ti, Zr, and Ta are each in an amount of 0–0.2%, and
Fe and incidental impurities: balance.

5,069,871

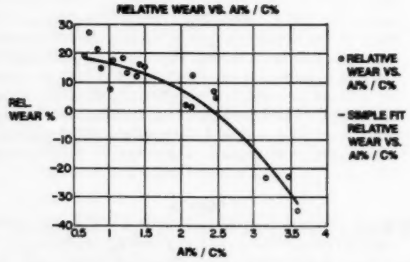
METHOD OF USING AN AUSTENITIC STEEL ALLOY AS A WEAR PART SUBJECT TO GOUGING ABRASION TYPE METAL LOSS

William E. Fuller, Lake Oswego, Oreg., assignor to ESCO Corporation, Portland, Oreg.

Continuation-in-part of Ser. No. 433,655, Nov. 8, 1989, abandoned, which is a continuation-in-part of Ser. No. 253,629, Oct. 5, 1988, abandoned. This application May 2, 1990, Ser. No. 518,082

Int. Cl.[5] C22C *38/38, 38/58*

U.S. Cl. 420—72 **2 Claims**



1. A method of using an austenitic steel alloy as a wear part subject to gouging abrasion type metal loss, for a crusher comprising:

providing an austenitic steel alloy having an aluminum to carbon ratio of 1.0 to 1.7 based on the following constituents:

Carbon	1.4–1.8%
Manganese	12–20%
Aluminum	1.5–2.5%
Silicon	0–1.0%
Chromium	0–2.5%
Nickel	0–3%
Molybdenum	0–2%
Vanadium	0–1%

with the balance being iron containing normal impurities, melting said constituents and testing the melted constituents for Al/C ratio and adjusting the constituent amounts when the Al/C ratio is outside the range of 1.0 to 1.7 to maintain the melted constituents in the Al/C ratio range of 1.0 to 1.7 to achieve gouging abrasion resistance and to avoid premature cracking due to excessive carbide film in the grain boundries when the said ratio is below 1.0, casting said alloy into a crusher part shape, said shape having wear resistance according to ASTM G81-83 least about 10% higher than that of Hadfields steel, and installing and using said shape in a crusher.

5,069,872

CUTTING TOOL

Frank J. Penoza, 201 Pine Knoll Cir., Autumn Hills, Del. 19707

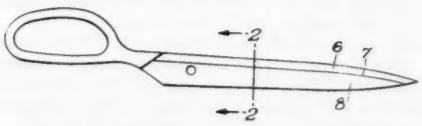
Filed Sep. 8, 1989, Ser. No. 404,777

Int. Cl.[5] G22F *3/00*

U.S. Cl. 420—436 **5 Claims**

1. In the method of cutting with an improved pair of hand shears, wherein the improvement comprises said shears having a cutting edge made of a composition consisting essentially of:

(a) 60% to 89% tungsten carbide,



(b) 4% to 28% tantalum carbide,
(c) 4% to 25% titanium carbide, and
(d) 3% to 30% cobalt.

5,069,873

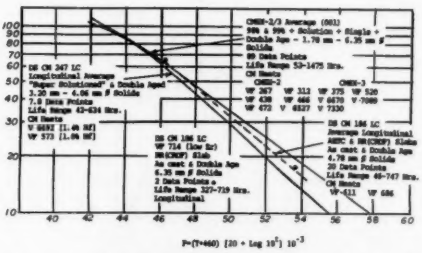
LOW CARBON DIRECTIONAL SOLIDIFICATION ALLOY

Kenneth Harris, Spring Lake, and Gary L. Erickson, Muskegon, both of Mich., assignors to Cannon-Muskegon Corporation, Muskegon, Mich.

Filed Aug. 14, 1989, Ser. No. 393,705

Int. Cl.[5] C22C *19/05;* **C22F** *3/00*

U.S. Cl. 420—448 **19 Claims**



1. A conventionally cast equiaxed grain, polycrystalline, integral turbine wheel or turbocharger rotor casting for use under high stress, high temperature conditions in small gas turbines and high performance piston and rotary engines, consisting essentially of (in ppm where indicated, otherwise in wt. %):

C	.05–.09
Si	.02 max
Mn	.02 max
P	.005 max
S	12 ppm max.
Cr	5.5–7.0
Co	9.0–9.5
Mo	.30–.70
W	8.0–9.0
Ti	.5–.9
Al	5.5–6.0
Ta	3.0–4.0
Hf	1.2–1.8
B	.010–.024
Zr	.004–.010
Fe	.15 max.
Cu	.01 max.
Cb	.10 max.
Mg	80 ppm max.
V	.05 max.
Re	2.8–3.1
N	10 ppm max.
O	10 ppm max.
Ni	Balance

5,069,874

METHOD FOR REDUCING HIGH-LOAD, LOW-SPEED WEAR RESISTANCE IN SLIDING MEMBERS

Takehiro Shirosaki, Fujisawa; Takashi Kikkawa, Isehara, and Hirotaka Toshima, Fujisawa, all of Japan, assignors to Oiles Corporation, Tokyo, Japan

Continuation of Ser. No. 370,258, Jun. 22, 1989, Pat. No. 5,000,915. This application Oct. 10, 1990, Ser. No. 595,088

Int. Cl.[5] C22C *9/04*

U.S. Cl. 420—478 **3 Claims**

1. A method of improving wear-resistance and reducing frictional resistance in sliding members, said method comprising preparing said sliding members from consisting essentially of 24 to 40 wt. % of Zn, 3 to 10 wt. % of Al, 0.1 to 4 wt. % of Cr, and the balance of Cu and placing said sliding members in low-speed, high-load conditions.

5,069,875

METHOD OF ADDING SILICON TO ALUMINUM

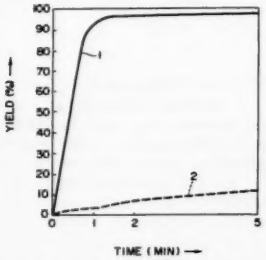
Koji Ohyama, Kawasaki, and Masaki Tsunoda, Tokyo, both of Japan, assignors to Nikkin Flux Inc., Tokyo, Japan

Filed Oct. 16, 1990, Ser. No. 598,200

Claims priority, application Japan, Oct. 16, 1989, 1-268547

Int. Cl.[5] C22C *1/02*

U.S. Cl. 420—548 **4 Claims**



1. A method of adding silicon to aluminum, wherein silicon particles having a diameter ranging between 2 mm and 50 mm are added to a molten aluminum together with a flux represented by the general formula XaMFb, where "X" represents an element included in the third or fourth period of the Periodic Table, "M" is a III or IV group element of the Periodic Table, and "F" is fluorine.

5,069,876

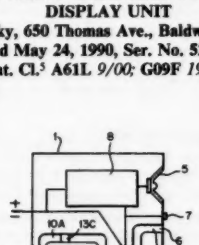
COMBINED SCENT AND AUDIO POINT OF SALE DISPLAY UNIT

Candace Oshinsky, 650 Thomas Ave., Baldwin, N.Y. 11510

Filed May 24, 1990, Ser. No. 528,712

Int. Cl.[5] A61L *9/00*; G09F *19/00*

U.S. Cl. 422—4 **9 Claims**



1. A scent and audio display unit comprising:

(a) a housing having a front wall in which a loudspeaker and fragrance porthole are operatively mounted;

(b) fragrance emitting and sound emitting means operatively mounted in said housing, said sound emitting means being in the form of a tape player which plays a prerecorded magnetic tape;

(c) an electrical power source operatively connected to said fragrance emitting and sound emitting means; and

(d) activating means operatively mounted on said housing and being connected to said electrical power source for simultaneously activating or deactivating said fragrance and sound emitting means by selectively connecting and disconnecting said fragrance emitting and sound emitting means from said electrical power source.

5,069,877

ARTICLE FOR DIFFUSING VOLATILE SUBSTANCES, AND IN PARTICULAR PERFUME

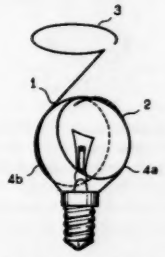
Michel L. Pozzo, Neuilly Sur Seine, France, assignor to Ateliers De Conceptions Et D'Innovations Industrielles, Courbevoie, France

Filed Mar. 7, 1989, Ser. No. 320,068

Claims priority, application France, Mar. 8, 1988, 88 02924

Int. Cl.[5] A61L *9/02*

U.S. Cl. 422—4 **12 Claims**



1. A method of diffusing a volatile substance comprising the steps of: absorbing said substance in a support element of heat shrink material which includes other than woven chlorofibers, bonded by a polyvinyl chloride resin, and diffusing said substance into an atmosphere by causing said support element to shrink through exposure to heat.

5,069,878

INTEGRITY PRESERVING AND DETERMINING URINE SAMPLE COLLECTION APPARATUS

Joel R. L. Ehrenkranz, Pleasantville Rd., New Vernon, N.J. 07976

Continuation of Ser. No. 195,660, May 19, 1988, abandoned, which is a continuation-in-part of Ser. No. 29,727, Mar. 24, 1987, Pat. No. 4,769,215. This application Mar. 15, 1991, Ser. No. 670,492

Int. Cl.[5] B01L *3/00*; G01K *13/00*; G01N *1/10, 21/77*

U.S. Cl. 422—61 **17 Claims**

1. A drug testing urine sample collection kit apparatus comprising:

a reservoir having a cavity therein for holding a sample of urine;

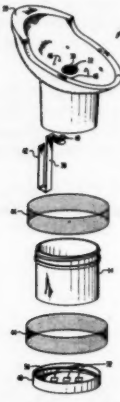
a collection means for collecting urine and transmitting it to said reservoir, said collection means including a bowl connectable to said reservoir, a tube connected to the bottom of said bowl and including a channel therein for communicating from said bowl into the cavity of said reservoir, said channel including a taper from a larger entrance aperture in the area of the bottom of said bowl to a smaller exit aperture near the discharge end of said tube;

a sphere having a specific gravity in the range of 1.001 to 1.002 and located in said tapered channel wherein said sphere prevents liquid with a specific gravity of less than about 1.002 from passing into said reservoir;

a keeper means for preventing said sphere from escaping from the large entrance aperture of said channel;

air venting means in said bowl for permitting air to escape from said reservoir as it fills up with urine and for preventing any substantial amount of urine from escaping from said reservoir when said apparatus is inverted; and,

a temperature detecting means for measuring the temperature of the urine as it is being collected in said reservoir



and for providing an indication of the collection temperature for a prolonged period of time after collection, thereby serving as an indication that the sample was fresh and unadulterated when collected,

wherein said tube prevents said urine from being emptied from said reservoir when said apparatus is inverted.

5,069,879

AUTOMATED APPARATUS FOR DETECTING GASEOUS COMPONENTS IN AIR WITH A COLORIMETRIC TESTING TUBE

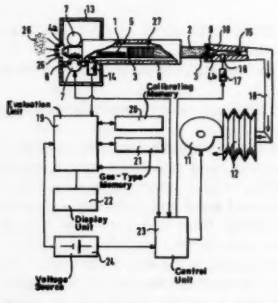
Kurt Leichnitz, Gross Grönau; Wolfgang May, Reinfeld; Wolfgang Bäther, and Wolfgang Evers, both of Lübeck, all of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Lübeck, Fed. Rep. of Germany

Filed Jun. 16, 1989, Ser. No. 367,325

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1988, 3821831

Int. Cl.[5] G01J *1/50*

U.S. Cl. 422—86 **9 Claims**



1. An apparatus for making a measurement of a gaseous component in air with a testing tube having openable ends and containing a charge responsive to the component, the apparatus comprising:

transport means for transporting a testing tube with both ends opened between a first position and a second position;

machine-readable memory means arranged on said testing tube for holding stored data pertaining to the measurement to be made;

read means for reading said stored data as the testing tube moves between said first and second positions and for scanning said testing tue and said charge to obtain measurement data with respect to the gaseous component detected;

an air pumping device including: a receiver for receiving one of the ends of the testing tube when said testing tube is moved into said second position; and, pumping means operatively connected to said receiver for taking a sample of air through said testing tube while in said second position;

evaluation means for receiving said stored data from said read means and processing said stored data together with said measurement data obtained by scanning said testing tube; and,

control means connected to said evaluation means for controlling the taking of the sample via said pump means in correspondence to said data.

5,069,880

OZONE STERILIZER

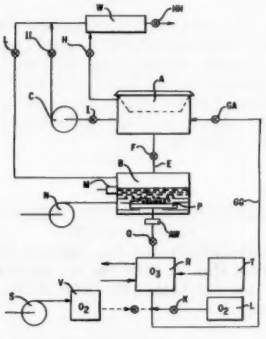
Eskil L. Karlson, 4634 State St., Erie, Pa. 16509

Division of Ser. No. 518,313, May 7, 1990, Pat. No. 4,988,484.

This application Jan. 22, 1991, Ser. No. 643,712

Int. Cl.[5] B01J *19/08, 19/12*

U.S. Cl. 422—186.19 **6 Claims**



1. A sterilizing apparatus comprising:

an ozone generator capable of operating at pressures from about 500 pounds per square inch to about 5000 pounds per square inch; said ozone generator connected to

a holding tank for receiving ozone under pressure wherein said ozone is mixed with water; said holding tank connected to

a sterilizing chamber which includes a means for receiving the water and ozone mixture and a means for releasing the said mixture received from said holding tank as a humid gas mixture into the said sterilizing chamber; said sterilizing chamber connected to

a means for evacuating said sterilizing chamber prior to release of said mixture, and

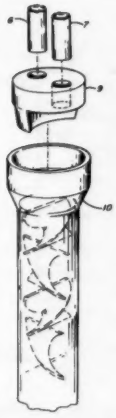
a means for withdrawing the mixture from said chamber.

5,069,881

DEVICE AND METHOD FOR APPLYING ADHESIVES

William J. Clarkin, Hickory, Pa., assignor to Mobay Corporation, Pittsburgh, Pa.

Filed Jul. 10, 1990, Ser. No. 550,408
Int. Cl.[5] B01J *19/26;* B01F *15/02*
U.S. Cl. 422—135 1 Claim



1. A device for applying a polyurethane adhesive to a surface comprising:

(j) a mixhead comprising

(1) hydraulically actuated means for controlling recirculation of a polyol component and an isocyanate component within said mixhead,

(2) a hydraulically actuated nozzle for controlling the flow of said polyol component from said mixhead,

(3) a hydraulically actuated nozzle for controlling the flow of said isocyanate component from said mixhead,

(ii) a dividing joint having a separator with a bow-tie cross section, said joint having holes to receive each of said nozzle and said separator extending past outlets of said nozzles, said joint functioning to keep said polyol component and said isocyanate component from contacting each other and being positioned such that said polyol component and said isocyanate component flow into said joint from said mixhead and thereafter flow out of said joint in two separate streams, and

(iii) a static mixer located such that said two separate streams flow into said static mixer, are mixed together therein, and thereafter flow out of said static mixer onto said surface, said joint being insertably positioned within said static mixer.

5,069,882

CARBON BLACK REACTOR WITH A CHOKE EXTENSION

William R. Jones, Jr., Monroe, La., assignor to Columbian Chemicals Company, Atlanta, Ga.

Division of Ser. No. 272,454, Nov. 17, 1988. This application Jul. 20, 1990, Ser. No. 556,028
Int. Cl.[5] C09C *1/48*
U.S. Cl. 422—150 4 Claims

1. Apparatus for the production of carbon black, comprising:

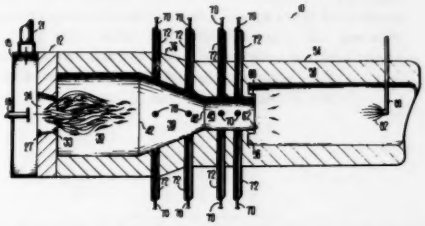
a first outer refractory shell defining an exit chamber and a first cross section, the outer shell having an upstream end with an upstream opening and a downstream opening distal from the upstream end;

a second outer refractory shell defining a reaction choke, the reaction choke extending from an inlet to the upstream end so that there is open flow communication from the choke through the upstream opening in the upstream end;

a third refractory shell defining a combustion section in open flow communication with the reaction choke;

means operatively associated with the combustion section for producing a flow of hot gas through the reaction choke into the exit chamber and through the exit chamber, the hot gas having a temperature sufficient to pyrolyze feedstock hydrocarbon and create a carbon black forming reaction;

means positioned upstream of the exit chamber for introducing feedstock hydrocarbon into the flow of hot gas to



form a flowing reaction mixture comprising hot gas and particles of forming carbon black; and

refractory means for defining a reaction choke outlet extension extending from the upstream end to an outlet opening within the exit chamber, the second outer refractory shell defining a second cross section substantially smaller than the first cross section, the extension defining means having a length sufficient to substantially eliminate impingement of the particles of forming carbon black against the upstream end of the first outer refractory shell,

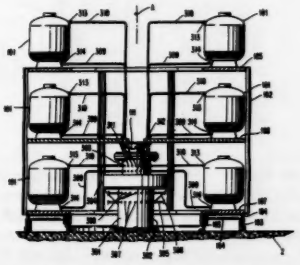
whereby production of the coke and erosion of the upstream end of the outer shell is substantially reduced.

5,069,883

DEVICE FOR CONTINUOUS CONTACTING OF LIQUIDS AND SOLIDS

Philip J. Matonte, Seffner, Fla., assignor to Progress Water Technologies Corp., St. Petersburg, Fla.

Filed Oct. 20, 1989, Ser. No. 424,819
Int. Cl.[5] B01D *11/02;* E03D *5/00*
U.S. Cl. 422—269 8 Claims



1. A liquid-solid contacting device comprising:

a plurality of chambers;

frame means for mounting said chambers in fixed relation to each other, said frame means including bearing means for rotating the chambers about an axis of rotation;

valve means for supplying and draining liquid from each of said chambers;

a supply conduit and a drain conduit respectively associated with one of said chambers and communicating between each of said respective chambers and said valve means;

said valve means including a pair of cylinders and means for holding one of the cylinders stationary and means for rotating the other cylinder for rotation relative to the stationary cylinder, said cylinders being in axial alignment with each other and having in common said axis of rotation one of said pair of cylinders being within the other of said pair of cylinders;

said frame means being affixed to the rotary cylinder for simultaneous rotation with the rotary cylinder, said stationary cylinder having a plurality of stationary inlet and outlet ports, said rotary cylinder having a plurality of rotary inlet and outlet ports which rotate as said rotating cylinder rotates, said supply and drain conduits being secured to the rotary inlet and outlet ports and to rotating transitional tubes in said rotary cylinder communicating between said stationary inlet and outlet ports and said rotary inlet and outlet ports, whereby fluid may flow into and out of the chambers through the transitional tubes as the cylinders rotate about the axis of rotation.

5,069,884

PROCESS FOR THE PURIFICATION OF AN AQUEOUS ALKALI METAL CHLORIDE SOLUTION FROM AMMONIUM AND IODINE COMPOUNDS

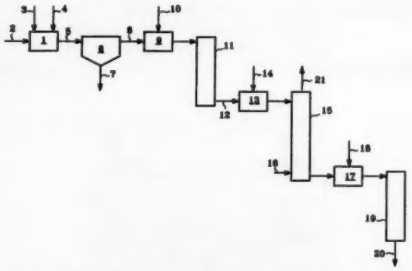
Mauro Filippone, Rosignano-Castiglioncello, and Carlo Lessi, Rosignano-Marittimo, both of Italy, assignors to Solvay & Cie (Societe Anonyme), Brussels, Belgium

Filed May 8, 1990, Ser. No. 520,526

Claims priority, application Italy, May 15, 1989, 20504 A/89

Int. Cl.[5] C01B *7/14;* C01D *3/06*

U.S. Cl. 423—181 **10 Claims**



1. Process for the purification of an aqueous alkali metal chloride solution from iodine compounds and from ammonium compounds, in which the iodine compounds and the ammonium compounds are oxidized and the iodine and nitrogen which are produced are removed, respectively, on a halogenated basic anion exchange resin and in a stream of inert gas, characterized in that the operation is carried out in two successive stages comprising a first stage in which the iodine compounds are oxidized and the resulting alkali metal chloride solution is then treated on the resin and a second stage in which the ammonium compounds are oxidized and the resulting alkali metal chloride solution is then subjected to the stream of inert gas and the pH of the alkali metal chloride solution is controlled below 3 in the first stage and above 2 in the second stage.

5,069,885

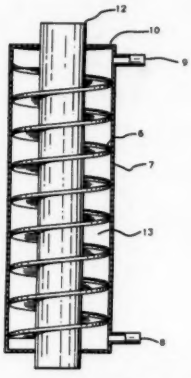
PHOTOCATALYTIC FLUID PURIFICATION APPARATUS HAVING HELICAL NONTRANSPARENT SUBSTRATE

David G. Ritchie, 41 Blue Ridge Crescent, London, Ontario, Canada N6K 2W9

Filed Apr. 23, 1990, Ser. No. 512,311

Int. Cl.[5] B01J *19/08*

U.S. Cl. 422—186 **12 Claims**



1. Apparatus for removing, reducing or detoxifying organic pollutants from a fluid, comprising:

(a) a fluid purification apparatus comprising a nontransparent substrate, having a photoreactive semiconductor material, bonded with or onto the surfaces of the nontransparent substrate, over which a fluid can flow in intimate contact with the photoreactive material in the presence of a photoactivating light, the nontransparent substrate forming a helix;

(b) a cylindrical lamp mounted at the center of the helix, capable of exposing said photoreactive material to light of a photoactivating wavelength;

(c) a jacket provided with inlet and outlet ports, enclosing the helix and the lamp, such that the inner wall of the jacket is in close proximity with the outer portion of the helix;

(d) end caps to the jacket provided with means to allow the ends of the lamp to extend therethrough in sealed fashion to maintain a fluid tight chamber within the boundaries of the jacket, the end caps, and the wall of the lamp.

5,069,886

PROCESS AND INSTALLATION FOR THE RECOVERY OF AMMONIA DURING THE SEPARATION OF NITROGEN OXIDE FROM WASTE GASES

Ruedi Frey, Lägernstrasse 1, Bassersdorf, and Hans Rüegg, Bremgartenstrasse 55, Wohlen, both of Switzerland

Continuation of Ser. No. 107,439, Oct. 13, 1987, abandoned. This application Sep. 26, 1990, Ser. No. 590,436

Claims priority, application Switzerland, Oct. 13, 1986, 4073/86

Int. Cl.[5] C01C *1/10, 1/12*

U.S. Cl. 423—237 **9 Claims**

1. A process wherein nitrogen oxides NO_x contained in waste gases produced by combustion of fossil fuels in a furnace are reduced with ammonia (NH_3) to elemental nitrogen N_2 and the reducing agent (NH_3) is recycled comprising the steps of:

providing a furnace;

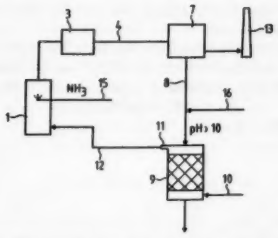
reacting the waste gases produced by combustion with ammonia NH_3 to reduce the nitrogen oxides to elementary nitrogen N_2;

subjecting the waste gases after being so reacted to waste gas cleaning whereby washing water removes the unreacted

ammonia which is known as slip from the waste gas to produce slip-enriched washing water;

raising the pH value of the slip enriched washing water to a value of more than 10;

introducing air into the pH-raised slip-enriched water to



remove the slip from the water and produce an air-slip mixture; and

recycling the air-slip mixture into the furnace to react with waste gases produced by combustion to reduce nitrogen oxides and thereby lower the amount of ammonia discharged into the atmosphere.

5,069,887

METHOD OF REFINING NITROGEN TRIFLUORIDE GAS

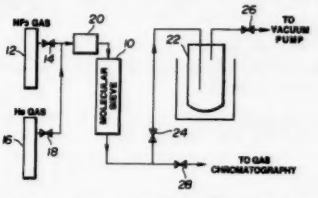
Takashi Suenaga, Yamaguchi; Tukasa Fujii, and Kobayashi, Yoshiyuki, both of Ube, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Jan. 10, 1991, Ser. No. 639,541

Claims priority, application Japan, Jan. 10, 1990, 2-3112

Int. Cl.[5] C01B *7/19, 21/083;* **B01D** *53/02*

U.S. Cl. 423—240 V **7 Claims**



1. A method of refining a nitrogen trifluoride gas containing CF_4 as impurity, the method comprising the steps of:

(a) bringing said nitrogen trifluoride gas into contact with a crystalline and porous synthetic zeolite, which is substantially uniform in pore size and about 4.9 Å in effective pore size, on condition that the content of water of crystallinity in said synthetic zeolite is in the range from 4 to 10 wt% and that said synthetic zeolite is maintained at a temperature not higher than 10° C. to thereby allow said synthetic zeolite to selectively adsorb NF_3 gas;

(b) after step (a) shielding said synthetic zeolite from any gas which contains CF_4; and

(c) after step (b) causing said synthetic zeolite to desorb refined NF_3 gas and collecting the desorbed refined NF_3 gas.

5,069,888

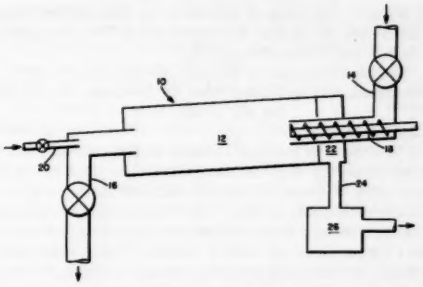
PROCESS FOR PASSIVATING URANIUM OXIDES TO CONTROL OXIDATION

Richard I. Larson; Abdul G. Dada, and John L. Harmon, all of Wilmington, N.C., assignors to General Electric Company, San Jose, Calif.

Filed Jul. 31, 1989, Ser. No. 387,187

Int. Cl.[5] C01G *43/00*

U.S. Cl. 423—260 **20 Claims**



1. A method of passivating the surface portion of particulate oxides of uranium with the formation thereon of a protective hydrate surface layer to inhibit oxygen chemisorption of the particle surfaces comprising the steps of:

passing a continuous flow of particulate oxides of uranium through the length of a rotating reaction vessel moving in intermingling contact with a counter-current continuous stream of a cooling gas comprising oxygen combined with an inert gas atmosphere in a proportion of about 0.3 up to about 0.6 percent oxygen by volume of the atmosphere.

5,069,889

CRYSTALLINE ALUMINUM PHOSPHORUS COMPOUNDS

Chanakya Misra, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation of Ser. No. 143,178, Jan. 13, 1988, abandoned. This application Jul. 20, 1990, Ser. No. 556,045

Int. Cl.[5] C01B *25/45*

U.S. Cl. 423—306 **14 Claims**

1. A crystalline alkali metal phosphorus compound of the general formula:

$$x(R_2O).Al_2O_3.y(P_2O_5).z(H_2O)$$

wherein R is an alkali metal, x is an integer from 1 to 4, y is an integer from 1 to 2, and z is a number, to include fractions, from 2 to 3.5, said compound having essentially an X-ray diffraction pattern selected from the group consisting of the X-ray diffraction patterns of Tables II and IV.

10. A process for preparing an alkali metal aluminum phosphorus compound of the general formula:

$$x(R_2O).Al_2O_3.y(P_2O_5).z(H_2O)$$

wherein R is an alkali metal, x is an integer from 1 to 4, y is an integer from 1 to 2, and z is a number, to include fractions,

from 2 to 3.5, said compound having essentially an X-ray diffraction pattern selected from the group consisting of the X-ray diffraction patterns of Tables II to IV, which comprises reacting a phosphate of the formula $(R)_a(H)_bPO_4$, wherein R is as previously defined, and a is an integer of from 1 to 3, and b=3−a with aluminum hydroxide or a water-soluble aluminum salt at a temperature of at least about 150° C.

5,069,890

ZEOLITE TREATING PROCESS

Pei-Shing E. Dai; David E. Sherwood, Jr., both of Port Arthur, and Bobby R. Martin, Beaumont, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 368,006, Jun. 19, 1989, abandoned. This application Mar. 18, 1991, Ser. No. 670,838

Int. Cl.[5] C01B *33/34*

U.S. Cl. 423—328 **17 Claims**

1. A process of treating a charge zeolite selected from the group consisting of (i) mordenite having a silica to alumina mole ratio of about 10–120, (ii) silicalite having a silica to alumina mole ratio of about 350–370, and (iii) dealuminated Y-zeolite having a silica to alumina mole ratio of about 3–10 and a Lattice Constant of about 24.30A–24.60A, which charge is characterized by the absence of secondary pores of diameter of about 100–600A which comprises

contacting said charge zeolite with steam at 1000° F.–1500° F.; maintaining said charge zeolite in said contact with steam for 5–60 hours during which time, said charge zeolite is converted into a hydrothermally-treated zeolite characterized by (i) decreased Lattice Constant of 24.23A–24.38A, (ii) a Secondary Pore Size of 100A–600A, (iii) an increased Secondary Pore Volume of 0.05–0.15 cc/g and (iv) a Secondary Pore Mode of 100A–325A; and recovering said hydrothermally-treated zeolite.

5,069,891

PROCESS FOR INDEPENDENT CONTROL OF METHANE AND RARE GAS CONTENTS OF AN AMMONIA-HYDROGEN RECOVERY-RARE GAS PLANT COMPLEX

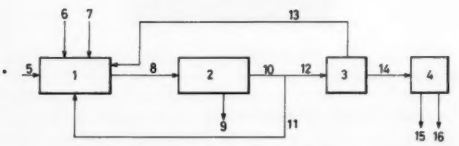
Horst Bendix; Bernd Hochmuth, both of Wittenberg; Dieter Johannes, Eutzsch; Bodo Lakenmacher, Bestensee; Winfried Lausch, Wittenberg, and Klaus Schuebel, Reinsdorf, all of German Democratic Rep., assignors to VEB Agrochemie Piesteritz, Wittenberg-Piesteritz, Fed. Rep. of Germany and Toyo Engineering Corporation, Tokyo, Japan

Filed Mar. 30, 1990, Ser. No. 502,254

Claims priority, application German Democratic Rep., Apr. 5, 1989, 327273

Int. Cl.[5] C01C *1/04*

U.S. Cl. 423—359 **8 Claims**



1. In a process for preparing ammonia by steam reforming of a hydrocarbon, said process comprising a synthesis gas generation section in which carbon dioxide is removed from ammonia synthesis gas, an ammonia synthesis loop and a gas recovery unit selected from the group consisting of a hydrogen recovery unit, a rare gas recovery unit and a combination thereof, the improvement comprising: removing a purge gas stream from the ammonia synthesis loop; dividing the purge gas stream into first and second streams, introducing said first stream into said synthesis gas generation section and introducing said second stream into said gas recovery unit to thereby enable separate control of methane and rare gas content in said ammonia synthesis loop.

5,069,892

CARBON BLACK FOR TIRE TREAD

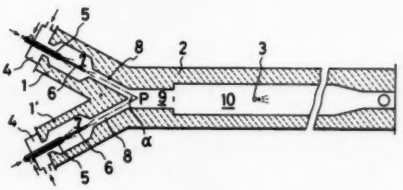
Kiyonari Nakai, Aichi, Japan, assignor to Tokai Carbon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 282,763, Dec. 12, 1988, abandoned. This application Oct. 26, 1990, Ser. No. 604,396

Claims priority, application Japan, Feb. 5, 1988, 63-23776

Int. Cl.[5] C01B *31/02*

U.S. Cl. 423—445 **2 Claims**



1. A carbon black for a highly resilient, and abrasion resistant tire tread, the carbon black having an N_2SA of 75 to 105 m^2/g, a compressive DBP absorption of at least 110 ml/100 g and

a true specific gravity $\leqq 1.9080-0.0016\times N_2SA$;

a void diameter of the particle aggregates (nm)$\geqq 62.2-0.236\times N_2SA$; and

a range of aggregate size distribution [ΔDst (nm)]$\geqq 30.6+0.6118\times \overline{D}st$.

5,069,893

POLYMERIC BASIC ALUMINUM SILICATE-SULPHATE

Dieter Haase, Ste-Catherine; Nelu Spiratos, La Prairie, and Carmel Jolicoeur, Deauville, all of Canada, assignors to Handy Chemicals Limited, La Prairie, Canada

Continuation-in-part of Ser. No. 266,854, Nov. 3, 1988, Pat. No. 4,981,675. This application Dec. 1, 1989, Ser. No. 444,792

The portion of the term of this patent subsequent to Oct. 31, 2006, has been disclaimed.

Int. Cl.[5] C01F *11/46*; D21H *21/16*; C02F *1/52*; B01D *21/01*

U.S. Cl. 423—556 **18 Claims**

1. An aqueous solution comprising a basic polynucleate aluminum hydroxy silicate-sulphate compound having a composition of the formula:

$$Al_A(OH)_B(SO_4)_C(SiO_X)_D(H_2O)_E$$

wherein

A is 1.0;

B ranges from 0.75 to 2.0;

C ranges from 0.30 to 1.12;

D ranges from 0.005 to 0.1;

X is greater than 2.0 but less than or equal to 4.0 such that $3=B+2C+2D\ (X-2)$; and

E is larger than 4; said solution having a basicity defined by $B/3A\times 100$ of 25–66%, and wherein said solution also contains up to 10 molar % based on the Al, of water soluble compounds of at least one multivalent cation selected from the group consisting of iron, magnesium, calcium, zinc and zirconium; and wherein said solution contains up to 10 molar %, based on the sulphate anions of water soluble compounds of at least one additional anion selected from the group consisting of phosphate, acetate, borate, chloride and carbonate.

5,069,894

PROCESS FOR PREPARING FINELY DIVIDED HIGHLY REACTIVE MAGNESIUM AND USE THEREOF

Borislav Bogdanovic, Mulheim/Ruhr, Fed. Rep. of Germany, assignor to Studiengesellschaft Kohle mbH, Mulheim, Fed. Rep. of Germany

Continuation of Ser. No. 946,412, Dec. 24, 1986, abandoned, which is a division of Ser. No. 895,658, Aug. 12, 1986, Pat. No. 4,731,203, and a continuation-in-part of Ser. No. 740,968, Jun. 13, 1985, Pat. No. 4,695,446, which is a continuation-in-part of Ser. No. 626,819, Jul. 19, 1984, Pat. No. 4,554,153, which is a continuation-in-part of Ser. No. 433,078, Oct. 6, 1982, abandoned, each is a continuation of Ser. No. 8,739, Feb. 2, 1979, abandoned. This application Jun. 27, 1990, Ser. No. 545,322

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1983, 3340492

Int. Cl.[5] **C01B** *6/04, 3/04*

U.S. Cl. 423—647 **9 Claims**

1. In the reversible preparation of active magnesium hydride MgH_2 by reaction of magnesium with molecular hydrogen at a pressure of from 1 to 2 bar and at a temperature of from 150° C. to 250° C., the improvement which comprises producing said magnesium by thermally decomposing a magnesium-containing compound selected from the group consisting of

(i) a magnesium anthracene and/or its derivatives prepared from magnesium and anthracene and/or its alkyl or phenyl derivatives,

(ii) a magnesium butadiene and/or its alkyl or phenyl derivatives prepared from magnesium and a conjugated diene having the general formula $R^1—CH=CR^2—CH=CH—R^3$, wherein R^1, R^2 and R^3 are the same or different and represent H, a linear or branched alkyl group having from 1 to 6 carbon atoms or a phenyl residue, and

(iii) a magnesium hydride prepared from magnesium and hydrogen in the presence of homogenous catalysts comprising a halide of a metal of the Subgroups IV to VII of the Periodic System and an organomagnesium compound or a magnesium hydride prepared from magnesium and hydrogen in the presence of a polycyclic aromatic or a tertiary amine, said thermal decomposition taking place at a pressure from 10^{-6} to 1 bar and in the absence or presence of an organic aprotic solvent, the magnesium obtained by said decomposition being isolated as a highly reactive powder.

5,069,895

METHODS FOR THE TREATMENT OF ALCOHOL INTOXICATION AND DEPENDENCE

Ivan F. Diamond, 761 San Diego Rd., Berkeley, and Adrienne S. Gordon, 23 Norwood Ave., Kensington, both of Calif. 94707

Filed Nov. 9, 1989, Ser. No. 434,066

Int. Cl.[5] **A61K** *49/00*

U.S. Cl. 424—10 **14 Claims**

1. A method for treating a host suffering from acute ethanol intoxication or chronic ethanol dependence, said method comprising administering an effective amount of on an adenosine antagonist to the host.

5,069,896

MALODOR INHIBITING SKIN DEODORANT COMPOSITION COMPRISING A MONOCLONAL ANTIBODY AND METHOD OF DEODORIZING

Brian Rogers, Mt. Airy, Md., and Anne Maczulak, Arlington, Va., assignors to The Gillette Company, Boston, Mass.

Filed Jun. 1, 1989, Ser. No. 360,154

Int. Cl.[5] **A61K** *7/32, 39/395;* **C07K** *15/28;* **C12N** *5/12*

U.S. Cl. 424—65 **14 Claims**

1. A skin deodorant composition comprising an effective amount of a skin deodorant to inhibit malodor in a topical vehicle, said skin deodorant composition comprising a monoclonal antibody or Fab fragment thereof produced by a hydridoma formed by the fusion between cells of mouse myeloma cells and immunized spleen cells from a non-human mammal, wherein said antibody which specifically binds with the 50,000 dalton carrier or transfer protein of a malodor producing bacterial cell to prevent malodor formation, said bacterial cell being a coryneform bacteria or of the genus Staphylococcus.

5,069,897

ANTIPERSPIRANT CREAMS

Thomas V. Orr, Cincinnati, Ohio, assignor to The Proctor & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 109,541, Oct. 16, 1987, abandoned, which is a continuation-in-part of Ser. No. 918,415, Oct. 14, 1986, abandoned. This application Aug. 10, 1989, Ser. No. 393,006

Int. Cl.[5] **A61K** *7/34, 7/36, 7/38*

U.S. Cl. 424—66 **13 Claims**

1. An antiperspirant cream composition comprising:

(a) from about 30% to about 50% of a volatile silicone oil;

(b) from about 15% to about 25% of non-volatile emollient having a viscosity of at least about 2 cs at 25° C.;

(c) from about 2% to about 7% of a particulate thickening material, which is colloidal silica having a particle size of less than about 1 micron; and

(d) from about 15% to about 45% of a particulate antiperspirant active material;

wherein said compositions have a penetration force value of from about 250 g to about 800 g, and a total level of particulate materials of from about 20% and about 40%.

5,069,898

HAIR ENRICHMENT COMPOSITION AND METHOD OF USE

Marvin E. Goldberg, Marlboro, N.J., assignor to Revlon, Inc., New York, N.Y.

Filed Apr. 24, 1989, Ser. No. 342,290

Int. Cl.[5] **A61K** *7/06, 7/08*

U.S. Cl. 424—70 **9 Claims**

1. An aqueous-based hair enrichment composition which is effective in restoring damaged shafts of hair and invigorating the scalp comprising, as a cosmetically acceptable carrier, a major amount of water and, in cosmetically effective amounts:

about 0.005 to about 15 wt % of hair sorbable bulking agent, comprising panthenol, biotin, mucopolysaccharides or mixtures thereof,

about 0.001 to about 5 wt % of a scalp blood vessel dilator which is a rubefacient selected from the group consisting of vitamin E nitcotinate, chloral hydrate, formic acid spirits, quinine, quinine salts, tincture of cantharides, tincture of cinchona, tincture of capsicum, cade tar, pine tar, and birch tar, and

about 0.002 to about 10 wt % of a scalp stimulant selected from cosmetically acceptable alcohols and antipruritic agents.

5,069,899

ANTI-THROMBOGENIC, ANTI-MICROBIAL COMPOSITIONS CONTAINING HEPARIN

Richard J. Whitbourne, Fairport, and Margaret A. Mangan, Rochester, both of N.Y., assignors to Sterilization Technical Services, Inc., Rochester, N.Y.

Filed Nov. 2, 1989, Ser. No. 430,340

Int. Cl.[5] **A61K** *31/74, 37/547, 31/725;* **A01N** *37/18*

U.S. Cl. 424—56 **11 Claims**

1. An anti-thrombogenic composition comprising heparin reacted with a quaternary ammonium component mixed with a water-insoluble polymer, whereby said composition exhibits a degree of anti-thrombogenic characteristics for a relatively long period of time, and a resistance to removal or deactivation in human or animal body fluids when coated on a substrate.

5,069,900

BORONIC ACID ADDUCTS OF TECHNETIUM-^{99m} DIOXIME-IMINE COMPLEXES

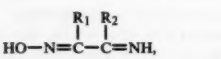
Karen E. Linder, Highland Park, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 28, 1989, Ser. No. 398,880
Int. Cl.[5] A61K *43/00, 49/02*
U.S. Cl. 424—1.1 21 Claims

1. A boronic acid adduct of technetium-^{99m} imine-dioxime having the formula

$$^{99m}TcX(Y)(Z)_2BR_3 \quad (I)$$

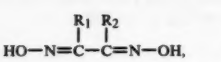
where X is selected from the group consisting of fluoro, chloro, iodo, bromo, hydroxy and isothiocyanate; Y is an imine-oxime having the formula



II

wherein R_1 and R_2 are each independently hydrogen, halogen, alkyl, aryl, amino or taken together a 5 or 6-membered oxygen, nitrogen or sulfur containing heterocycle, or together R_1 and R_2 are $—(CR_8R_9)_n—$wherein n is 3, 4, 5 or 6 and R_8 and R_9 are each independently hydrogen or alkyl;

Z ia a vicinal dioxime having the formula



III

where R_1 and R_2 are defined as they are in formula II above; and BR_3 is a boron derivative wherein R_3 is hydroxy, alkyl, alkenyl, cycloalkyl, cycloalkenyl, alkoxy, hydroxyalkyl, aryl, arylalkyl or a 5 or 6-membered nitrogen containing heterocycle.

5,069,901

PREPARATION OF A RECOMBINANT SUBUNIT VACCINE AGAINST PSEUDORABIES INFECTION

Elaine V. Jones; Mark W. Mellencamp, and Timothy J. Miller, all of SmithKline Beckman Corp., Corporate Patents N-160, P.O. Box 7929, Philadelphia, Pa. 19101

Filed Feb. 3, 1988, Ser. No. 151,736
Int. Cl.[5] A61K *39/12;* C12N *15/00*
U.S. Cl. 424—89 16 Claims

1. A recombinant pseudorabies virus (PRV) vaccine for inducing immunity in a pig against infection by PRV which comprises an effective amount of recombinant PRV divalent subunit antigens, gp50:63, free of PRV virus particles.

5,069,902

VIRUS AND VACCINE THEREFROM FOR USE AGAINST TURKEY RHINOTRACHEITIS

Jane K. A. Cook, Huntingdon; Christine A. Dolby, Chalfont St. Peter; Albert P. A. Mockett, Huntingdon; Matthew M. Binns, Huntingdon; Judith A. Frazier, Huntingdon, and Philip Box, Watlington, all of England, assignors to British Poultry Federation Research Association, London, England

Filed May 18, 1988, Ser. No. 195,600
Claims priority, application United Kingdom, May 21, 1987, 87/12042; Aug. 28, 1987, 87/20318
Int. Cl.[5] A61K *39/12;* C12N *7/00*
U.S. Cl. 424—89 11 Claims

1. An attenuated strain of the virus of contagious turkey rhinotracheitis, which attenuated strain is deposited under the deposit Ser. No. V87051102 at the European Collection of Animal Cell Cultures.

5,069,903

THERAPEUTIC AND NUTRITIVE FLAX SEED COMPOSITION AND METHODS EMPLOYING THE SAME

Paul A. Stitt, 123 Cleveland Ave., Manitowoc, Wis. 54220

Continuation of Ser. No. 133,967, Dec. 16, 1987, abandoned. This application Dec. 19, 1990, Ser. No. 629,036
Int. Cl.[5] A61K *35/78, 33/32*
U.S. Cl. 424—195.1 54 Claims

1. A method for improving general health and appearance of an animal, increasing Omega-3 content of said animal's tissue or decreasing cholesterol content of said animal's tissue comprising administering orally to said animal a biologically effective amount of a stable dry edible composition comprising ground raw flax seed.

5,069,904

METHOD OF USING NICOTINE IN THE TREATMENT OF CONDITIONS SUSCEPTIBLE TO SAID TREATMENT

Joseph G. Masterson, Dublin, Ireland, assignor to Elan Corporation, PLC, Athlone, Ireland

Filed Jan. 5, 1990, Ser. No. 461,428
Claims priority, application Ireland, Jan. 6, 1989, 43/89
Int. Cl.[5] A61K *6/00, 9/68, 9/62;* A61F *13/00*
U.S. Cl. 424—401 30 Claims

1. A method of treating a condition susceptible to nicotine therapy which comprises administering a medicament containing nicotine to a subject in need of such treatment, wherein said medicament is administered to a subject initially having a blood supply substantially free of nicotine at a sub-therapeutic dose in the range of 1–5 mg/day and for a period of time sufficient to allow said subject to tolerate said dose without showing any adverse effects and thereafter increasing the dose of nicotine at selected intervals of time until a therapeutic dose is achieved.

5,069,905

METHOD AND COMPOSITIONS COMPRISING A VITAMIN D DERIVATIVES FOR THE LOCAL TREATMENT OF BONE FRACTURES

Cobi Lidor, Herzeliya; Samuel Dekel, Ramat-Gan; Samuel Edelstein, Rehovot, and Michael S. Meyer, Tel-Aviv, all of Israel, assignors to Yeda Research and Development Company Limited, Israel

Continuation of Ser. No. 840,511, Mar. 17, 1986, abandoned. This application Jul. 26, 1989, Ser. No. 385,816
Claims priority, application Israel, Mar. 15, 1985, 74617
Int. Cl.[5] A61F *2/00;* A61K *31/59*
U.S. Cl. 424—423 19 Claims

1. A composition for the treatment and promotion of healing of bone fracture and osteotomies in warm-blooded animals including humans by bringing the composition into direct contact with the bone fracture or osteotomy by local application thereof, said composition comprising

as carrier an orthopedic implant or prosthesis having incorporated therein or thereon from 0.002 to 0.2% by weight of $24,25(OH)_2D_3$ in combination with a physiologically compatible vehicle suitable for use in orthopedic surgery.

5,069,906

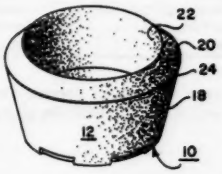
INTRA-VAGINAL DEVICE AND METHOD

Robert S. Cohen, New York, N.Y.; James M. Pierce, and William H. Kinsey, both of Coral Gables, Fla., assignors to MaxiMed Corporation, New York, N.Y.

Continuation of Ser. No. 257,156, Oct. 14, 1988, Pat. No. 4,983,393, which is a continuation of Ser. No. 57,898, Jul. 21, 1987, abandoned. This application Dec. 11, 1990, Ser. No. 625,808
Int. Cl.[5] A61K *9/02*
U.S. Cl. 424—430 2 Claims

1. A solidified gel composition suitable for use as an intravaginal insert, capable of dissolution or disintegration in the

presence of vaginal fluids and consisting essentially of an aqueous saline solution containing a gelling agent dissolved or dispersed therein, said gelling agent being selected from the group consisting of agarose or agar, glycosaminoglycan, colla-



gen, carageen or carageenan, locust bean gum, fibrin and glycerine, and an enzyme selected from the group consisting of protease, agarase, collagenase and saccharidase, said gelling agent and said enzyme being present in said composition in minor amounts totaling less than fifty percent by weight.

5,069,907

SURGICAL DRAPE HAVING INCORPORATED THEREIN A BROAD SPECTRUM ANTIMICROBIAL AGENT

Grover C. Mixon, Kingstree, S.C., and Willard L. Morrison, Winston-Salem, N.C., assignors to Phoenix Medical Technology, Andrews, S.C.

Filed Mar. 23, 1990, Ser. No. 498,193
Int. Cl.[5] A61L *15/00*
U.S. Cl. 424—445 **5 Claims**

1. A sheet material for use as a surgical drape comprising:

a polyethylene film or fabric having external surfaces, said film or fabric having incorporated therethrough 5-chloro-2-(2,4-dichlorophenoxy)phenol in an amount of about 0.01% to about 25% by weight of said film; and

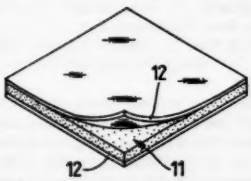
a pressure sensitive adhesive coated into one of said external surfaces, said pressure sensitive adhesive having incorporated therethrough an amount of 5-chloro-2-(2,4-dichlorophenoxy)phenol in an amount of about 0.01% to about 25% by weight of said adhesive.

5,069,908

CROSSLINKED HYDROGEL AND METHOD FOR MAKING SAME

Ernest J. Henley, Houston, Tex., assignor to Henley International, Inc., Sugar Land, Tex.

Continuation-in-part of Ser. No. 367,783, Jun. 19, 1989, abandoned. This application Jun. 6, 1990, Ser. No. 533,805
Int. Cl.[5] A61F *13/00*
U.S. Cl. 421—449 **10 Claims**



1. A crosslinked hydrogel for use in transcutaneous electrical nerve stimulation and iontophoresis to provide transdermal delivery of an active ingredient comprising:

(a) an active ingredient selected from the class of lidocainehydrochloride, hydrocortisone, menthol or methyl salicylate;

(b) a crosslinking agent, aluminum acetate in a quantity of about 0.1% to about 0.5% by weight to provide ionic conductivity in said hydrogel;

(c) water;

(d) an emulsifier selected from the class of propyleneglycol, lanolin, stearic acid or ethyl alcohol; and

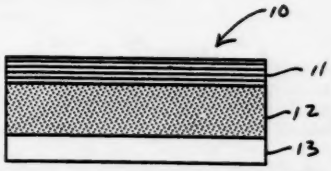
(e) carboxymethylcellulose in an amount of between 1.1% to 1.7% by weight, wherein said hydrogel is characterized by having an electrical resistance of less than 10,000 ohms per linear centimeter.

5,069,909

TRANSDERMAL ADMINISTRATION OF BUPRENORPHINE

Kuldeepak Sharma; Samir D. Roy, both of Mountain View, and Eric J. Roos, Redwood City, all of Calif., assignors to Cygnus Therapeutic Systems, Redwood City, Calif.

Filed Jun. 20, 1990, Ser. No. 540,908
Int. Cl.[5] A61F *13/00*
U.S. Cl. 424—449 **6 Claims**



1. A laminated composite for administering buprenorphine hydrochloride to an individual transdermally comprising:

(a) a polymer backing layer that is substantially impermeable to buprenorphine hydrochloride; and

(b) a reservoir layer comprising a water-base acrylate pressure-sensitive adhesive, 1 to 12% by weight buprenorphine hydrochloride and 2 to 25% by weight of a permeation enhancer comprising propylene glycol monolaurate in combination with capric acid or oleic acid, wherein the skin contact area of the composite is 10 to 100 cm^2 and the rate of administration from the composite is about 1 to about 100 $\mu g/hr$.

5,069,910

DISPERSIBLE CIMETIDINE TABLETS

Mateja Kovacic; Jenny Milovac, both of Ljubljana; Polona Cvelbar, Velike Lasce; Anton Stalc, Ljubljana; Zvezdana Trost, Vrhnika; Zdravko Kopitar, Menges; Bojan Kofler, Skofja Loka; Vida Nikolic, Ljubljana; Marija Lampret, Sentvid pri Sticni, and Marija Lippai, Ljubljana, all of Yugoslavia, assignors to Lek, Yugoslavia

Filed Jun. 15, 1989, Ser. No. 366,437
Claims priority, application Yugoslavia, Jun. 23, 1988, 1209/88
Int. Cl.[5] A61K *9/20*
U.S. Cl. 424—464 **13 Claims**

1. Dispersible cimetidine tablets containing one of the polymorphous modifications of cimetidine A, B or C, comprising from 30 to 90% by weight of cimetidine, from 5 to 55% by weight of one or more disintegrating agents selected from the group consisting of starch, modified starches, microcrystalline cellulose, and cross-linked carboxymethyl cellulose, from 0.05 to 5.0% by weight of a surfactant selected from the group consisting of sodium lauryl sulphate, a polyoxyethylene-polyoxypropylene polymer of the formula

$$HO(CH_2CH_2O)_a—(CH(CH_3)CH_2O)_b(CH_2CH_2O)_cH,$$

wherein a is 75, b is 30, and c is 75, polyalkoxyalkylene sterol ethers of the formula

$$RO\,(CH_2)_n\text{-}O_xH$$

wherein RO denotes the sterol moiety, n is an integer of 2 or 3 and x represents a number between 8 and 30; and wherein said cimetidine is employed in the form of particles the size of which particles is less than 200 μm with 95% of particles having a size of between 20 and 100 μm.

5,069,911

PHARMACEUTICAL 9,10-DIHYDROGENATED ERGOT ALKALOID CONTAINING COMPOSITIONS

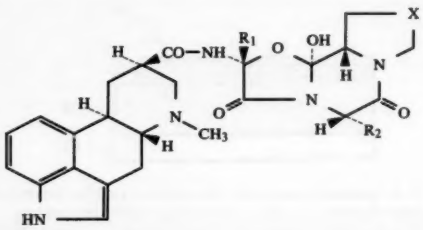
Othmar Züger, Allschwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 323,515, Mar. 14, 1989, abandoned, which is a continuation of Ser. No. 826,172, Feb. 5, 1986, abandoned. This application Jun. 22, 1990, Ser. No. 542,457

Int. Cl.[5] A61K *9/26, 9/52, 31/48*

U.S. Cl. 424—469 **11 Claims**

1. A controlled release formulation for oral administration comprising a 9,10-dihydro ergot of the formula



wherein

R_1 and R_2 may be the same of different,

R_1 is (C_{1-4})alkyl, and

R_2 is (C1-4)alkyl, or benzyl, and

X is CH_2

as a drug compound selected from the group consisting of, dihydroergoncornine, dihydroergocristine, dihydro-α-ergocryptine, dihydro-β-ergocryptine, co-dergocrine, dihydroergotamine,

epicryptine and acid addition salts thereof

a pharmaceutically acceptable inert fatty material, in a weight ratio of drug compound to fatty material of 1:0.5 to 1:10 and selected from the group consisting of beeswax, fatty acids, fatty acid esters, long chain fatty alcohols and oils in the form of granule particles, the granulate particles being enveloped with dry particles of a pharmaceutically acceptable hydrophilic swellable substance in a weight ratio of drug compound to swellable substance of 1:4 to 1:50, the swellable substance selected from the group consisting of, natural or synthetic anionic or nonionic hydrophilic gums, modified cellulose and proteinaceous substances.

5,069,912

METHOD OF TREATING SPASTIC COLITIS

Charles A. Jensen, 401 E. California Blvd., Pasadena, Calif. 91106

Division of Ser. No. 299,436, Jan. 23, 1989, Pat. No. 4,968,510, which is a division of Ser. No. 822,532, Jan. 27, 1986, Pat. No. 4,810,496, which is a continuation-in-part of Ser. No. 702,946, Feb. 17, 1985, abandoned. This application Aug. 31, 1990, Ser. No. 575,574

Int. Cl.[5] A61K *33/34*

U.S. Cl. 424—630 **1 Claim**

1. A method of treating the condition spastic colitis, comprising:

administering to an animal or human having said condition an effective amount of a mixture in percent by weight of:

ammonium sulfate	about 83.0
aluminum oxide hydrate	about 7.25
iron	about 3.33
magnesium oxide	about 1.99
silicon dioxide	about 0.62
sodium hydroxide	about 0.42
potassium hydroxide	about 0.46
free water	up to 2.53

including trace amounts of copper, zinc and calcium, optionally with a pharmaceutically acceptable carrier or diluent.

5,069,913

VANADIUM-PEROXIDE COMPOSITIONS AS INSULIN MIMICKERS

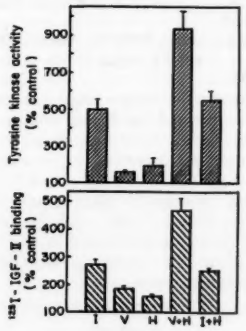
Barry I. Posner, 125 Geneva Crescent, Quebec, Canada H3R 2A7 , and I. George Fantus, 4745 Meridian, Westmount, Canada H3W 2C2

Continuation of Ser. No. 105,212, Oct. 7, 1987, Pat. No. 4,882,171. This application Sep. 12, 1989, Ser. No. 406,253

Claims priority, application Canada, Oct. 16, 1986, 520,627

Int. Cl.[5] A61K *33/26, 33/40, 31/075, 37/26*

U.S. Cl. 424—646 **1 Claim**



1. A pharmaceutical composition having a broad insulin mimicry effect, including stimulation of protein synthesis comprising an effective amount for broad insulin mimicry of a pervanadate and a pharmaceutically acceptable carrier said composition containing no free peroxide.

5,069,914

FOOD PRODUCT HAVING REDUCED LIKELIHOOD OF CHOKING

Eugene D. Gagliardi, Jr., West Chester, Pa., assignor to Designer Foods, Inc., Wilmington, Del.

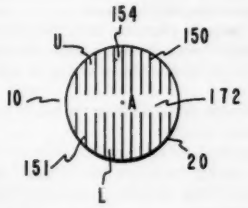
Filed Nov. 22, 1989, Ser. No. 440,965

Int. Cl.[5] A23L *1/317*

U.S. Cl. 426—76 **8 Claims**

1. An elongate meat product having a top surface, a bottom surface, a length and a central axis extending along the length, said meat product comprising an unsegmented first portion and a second portion substantially contiguous to the first portion extending generally parallel to the central axis, said second portion comprising at least two separable segments, said meat product further comprising a segmented third portion, the unsegmented first portion comprising a layer positioned generally midway between the top surface and the bottom surface, the segmented second portion extending between the first portion and the top surface and the segmented third portion extending between the first portion and the bottom surface, said first portion and said segments being sized such that a

consumer's biting into the meat product generally perpendicular to and through the central axis results in said segments being readily separated to reduce the likelihood of choking on the meat product.



5,069,915

COCOA BUTTER FRACTIONS

Michael T. Devitt, Doddinghurst, and Mark Weyland, Sidcup, both of Great Britain, assignors to Van den Bergh Foods Co., Division of Conopco, Inc., Lisle, Ill.

Filed Aug. 13, 1990, Ser. No. 566,642

Claims priority, application United Kingdom, Oct. 27, 1989, 8924288

Int. Cl.[5] A23G *3/00*

U.S. Cl. 426—93 25 Claims

1. Cocoa butter olein fraction, characterised by an N_{30} value of less than 5, an N_{20} value of at least 40, an iodine value of 35-45 and the presence of at least 25 wt % 1,3-dipalmityl triglycerides.

5,069,916

PROCESS FOR MICROWAVE BROWNING, COMPOSITION USED FOR SAME AND PRODUCT PRODUCED THEREBY

Lawrence L. Buckholz, Middletown; Marion A. Sudol, Boonton, and Brian Byrne, East Brunswick, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 596,498, Oct. 12, 1990, which is a division of Ser. No. 535,529, Jun. 8, 1990, Pat. No. 4,985,261, which is a continuation-in-part of Ser. No. 440,794, Nov. 24, 1989, Pat. No. 4,943,697, which is a division of Ser. No. 356,503, May 25, 1989, Pat. No. 4,904,490, which is a continuation-in-part of Ser. No. 295,450, Jan. 10, 1989, Pat. No. 4,882,184. This application May 16, 1991, Ser. No. 700,778

Int. Cl.[5] A23L *1/00;* A21D *6/00*

U.S. Cl. 426—243 4 Claims

1. A process for providing a cooked baked goods foodstuff comprising the steps of:

(a) providing an uncooked baked goods composition having a continuous surface;

(b) providing a mixture of:

(i) 10-20% proline;

(ii) 2-5% ribose;

(iii) 30-60% fructose; and

(iv) 40-60% of a solvent selected from the group consisting of:

water;

propylene glycol;

glycerine;

a mixture of water and glycerine;

a mixture of propylene glycol and water; and

a mixture of propylene glycol and glycerine;

(c) coating the mixture of (b) onto the surface of an uncooked foodstuff provided in (a); and

(d) exposing the thus coated uncooked foodstuff to microwave radiation for a period of time between 40 seconds and 360 seconds, with the pH of the coating being in the range of from about up to about 13.

5,069,917

METHOD OF PREPARING HOT OAT CEREAL IN A MICROWAVE OVEN

William L. Keyser, West Dundee; Ronald K. Medrow, Spring Grove, and Thomas E. Milling, Lake Zurich, all of Ill., assignors to The Quaker Oats Co., Chicago, Ill.

Division of Ser. No. 272,286, Nov. 15, 1988. This application Mar. 8, 1991, Ser. No. 667,614

Int. Cl.[5] A23L *1/00*

U.S. Cl. 426—243 7 Claims

1. In a method of preparing a hot oat cereal in a microwave oven which comprises the steps of mixing dry oat cereal with water to form an aqueous mixture, and cooking the resulting mixture in a microwave oven while said mixture is in a container, the improvement which comprises cooking said resulting mixture in the presence of lecithin in an amount effective to prevent said mixture from foaming out of said container during said microwave cooking step.

5,069,918

METHOD OF COLORING FOODS

Ernst Graf, New Brighton, Minn.; Marcus Karel, Newton, Mass., and Israel A. Saguy, Edina, Minn., assignors to The Pillsbury Company, Minneapolis, Minn. and Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 338,828, Apr. 17, 1989, Pat. No. 5,002,789. This application Feb. 4, 1991, Ser. No. 653,401

Int. Cl.[5] A23L *1/00*

U.S. Cl. 426—243 30 Claims

1. A process of preparing a heated food product to produce color in a preselected region thereof during exposure to heat said product to a temperature in excess, said process including:

applying a food color system to a preselected region of a food product substrate; the food color system comprising:

a colorant in particle form wherein at least a weight majority of the particles have a size in the range between about 10 microns and about 150 microns and having a preselected CIE L* value; and

a diluent mixed with said colorant with said diluent being in a particle form, having a selected particle size and being present in a quantity sufficient to provide a DE value of at least about 10, said diluent further having the property of being dissipatible when used in conjunction with a food product during exposure of said food product to microwave radiation; and

having said color system and substrate for a time period sufficient to effect a color change in said preselected region to provide a preselected color.

5,069,919

PROCESS FOR BLEACHING/SANITIZING FOOD FIBER

A. Thomas Weibel, Cranbury, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 564,242, Aug. 8, 1990. This application Oct. 22, 1990, Ser. No. 600,658

Int. Cl.[5] C12P *7/10;* C13K *1/02;* D21C *3/26*

U.S. Cl. 426—261 8 Claims

1. A high yield process for treating a lignocellulose fiber substrate comprising:

a) uniformly distributing a sufficient quantity of an aqueous solution containing hydrogen peroxide over the lignocellulose fiber substrate to provide as a reaction mixture about 5 to 15 parts by weight hydrogen peroxide per hundred parts by weight dry lignocellulose fiber substrate and about 5 to 25 parts water per hundred parts dry lignocellulose substrate to provide about 50 to 70 parts lignocellulose fiber substrate on a dry basis in said reaction mixture,

b) maintaining the pH of said reaction mixture to about 3 to about 7, and

c) maintaining the reaction mixture at about 20° C. to about 100° C. for a sufficient time to reduce the quantity of hydrogen peroxide in the reaction mixture by at least about 50% to provide a high yield of a sanitized, bleached lignocellulose fiber substrate.

5,069,920

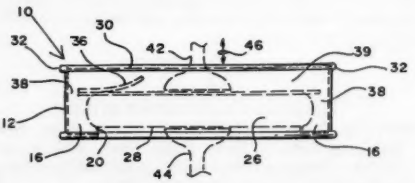
ELECTRIC CONDUCTION COOKING METHOD

Victor F. Hildebrand, 10910 Shallowford Rd., Roswell, Ga. 30075

Continuation of Ser. No. 8,006, Jan. 29, 1987. This application May 23, 1990, Ser. No. 528,068

Int. Cl.[5] B65B *29/08*

U.S. Cl. 426—234 **11 Claims**



1. A method of electrical conduction cooking comprising:

preparing electrically conductive food in a single portion for insertion into a food storage and cooking chamber which is defined by sidewalls laterally circumscribing the food storage and cooking chamber, a bottom of which is comprised of an electrically conductive material having a raised center portion serving as a bottom electrode and further configured with a peripheral reservoir recessed from said center portion and interposed between said sealingly attached to both the sidewalls and center portion said reservoir being configured to allow drainage and accumulating of fat and other fluids exuded from said food during electrical conduction cooking away from said food and said bottom electrode;

inserting the electrically conductive food into the food storage and cooking chamber and onto said raised center portion above said reservoir so that said food is supported on and is in electrical contact with the bottom electrode;

placing a top electrode of electrically conductive material into the top of the food storage and cooking chamber and onto the food supported on said bottom electrode to provide electrical contact with the food, said top electrode being sized to be separated from the sidewalls to leave an air gap between said top electrode and said sidewalls;

attaching sealingly to the sidewalls above the top electrode a removable lid to seal the food in said storage and cooking chamber and thereby retain qualities of the food stored in the food storage and cooking chamber prior to cooking, said removable lid in combination with the top electrode and food storage and cooking chamber forming an electric conduction cooking container;

transporting the sealed electric conduction cooking container and food inserted therein to a cooking apparatus having an upper power source contacter and a lower power source contacter;

detaching from the sidewalls above the top electrode the removable lid;

establishing intimate electrical communication between the upper power source contacter and top electrode and also between the lower power source contacter and bottom electrode to send the electrical current through said food to cook, the food while

accumulating in the peripheral reservoir and away from said food and bottom electrode, fats and other liquids exuded from the food by cooking to prevent the contamination of said bottom electrode by said exuded fats and other liquids and their adverse effects on the electrical conductivity between said bottom electrode and said food while optimizing intimate electrical communication between the bottom electrode and the food;

terminating intimate electrical communication between the upper power source contacter and top electrode and also between lower power source contacter and bottom electrode;

removing the top electrode from the top of the food storage and cooking chamber;

withdrawing the food thus cooked from the electrical conduction cooking container leaving said exuded fats and other liquids in the peripheral reservoir rendered from the food by cooking;

serving for immediate consumption said food in a single portion withdrawn from the electrical conduction cooking container; and

discarding the electric conduction cooking container with peripheral reservoir containing said exuded fats and other liquids.

5,069,921

METHOD OF PREPARING AN ENCRUSTED FOOD PRODUCT

Edward A. Madanat, 8 Inverness Ct., Lindenheath, Wilmington, Del. 19808

Filed Jun. 25, 1990, Ser. No. 543,024

Int. Cl.[5] A21D *2/00*

U.S. Cl. 426—283 **9 Claims**

1. A method for preparing an encrusted pizza food product which comprises:

a) co-extruding dough with a cheese whereby the dough forms an encapsulation shell surrounding the cheese,

b) subjecting the co-extruded article from a) to a temperature sufficient to at least partially bake the dough and to cause the cheese to melt and generate gases whereby the gases expand and create an open cavity within the encapsulating dough and the cavity is lined with molten cheese thereby providing a sealant for the dough exterior to the cavity,

c) setting the molten cheese lining the dough cavity by chilling the article from b), and thereafter,

d) providing the lined cavity with a pizza sauce by injecting the pizza sauce into cavity.

5,069,922

PROCESS FOR TREATING POULTRY CARCASSES TO CONTROL SALMONELLAE GROWTH

Eugene Brotsky, 5453 Covode St., Pittsburgh, Pa. 15217, and Frederic G. Bender, 142 Irwin Ave., Houston, Pa. 15342

Continuation of Ser. No. 308,357, Feb. 9, 1989. This application May 29, 1990, Ser. No. 530,131

Int. Cl.[5] A23L *3/34, 1/315*

U.S. Cl. 426—332 **9 Claims**

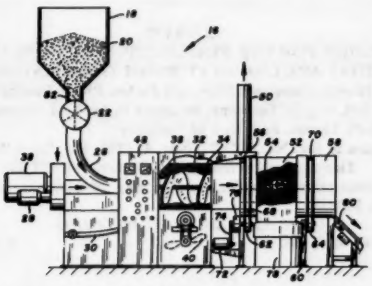
1. A process for treating poultry carcasses comprising contacting eviscerated and defeathered poultry with a treatment solution having a pH above about 11.5 and containing trialkali metal orthophosphate being present in an amount of from about 4% to about 12% based on the weight of the solution, for a period of time effective to remove, reduce or retard salmonella bacterial contamination and insufficient to cause organoleptic depreciation of the poultry.

5,069,923

APPARATUS AND PROCESS FOR EXPANDING RAW AMARANTH

Edward S. Hubbard, Wells, and Terry J. Guanella, Bricelyn, both of Minn., assignors to American Amaranth, Inc., Bricelyn, Minn.

Filed Sep. 17, 1990, Ser. No. 583,146
Int. Cl.[5] A23L *1/00*
U.S. Cl. 426—445 19 Claims



10. A process for expanding raw, wholeseed amaranth grain, including the steps of:

combining raw, wholeseed amaranth with water, then tempering the mixture until the moisture content is uniform and in the range of from 14 to 18 percent by weight;

agitating the tempered amaranth in a porous popping container, while simultaneously directing a stream of heated air onto the amaranth from outside of the container, thus to expand the amaranth; and

separating the expanded amaranth from the unexpanded amaranth and other matter.

5,069,924

LOW CALORIE BEVERAGE

John B. Baccus, Jr., Irving, Tex., assignor to The Southland Corporation, Dallas, Tex.

Continuation of Ser. No. 341,781, Apr. 21, 1989, Pat. No. 4,986,994. This application Dec. 17, 1990, Ser. No. 629,115
The portion of the term of this patent subsequent to Jan. 22, 2008, has been disclaimed.
Int. Cl.[5] A23L *2/00*
U.S. Cl. 426—590 18 Claims

1. A low calorie semi-frozen beverage comprising:

water, a substantial portion of said water taking the form of ice crystals which are sufficiently small that the beverage has a velvety mouthfeel;

a syrup comprising:

an artificial sweetener;

microcrystalline cellulose in sufficient quantity to lower the freezing point of said beverage and cause the formation of said small ice crystals upon freezing at a temperature between 26 and 28 degrees Fahrenheit, said microcrystalline cellulose hydrated by and dispersed throughout said solution to form a colloidal suspension;

a natural sweetener;

a foaming agent including saponin for stabilizing foam created upon later agitation of said water and said syrup; and

a flavoring for providing the desired taste to said beverage; and

carbon dioxide.

5,069,925

PREPARATION OF TEA PRODUCTS

Eldon C. Lee, New Milford, and Ernest K. Gum, New Fairfield, both of Conn., assignors to Nestec S.A., Vevey, Switzerland

Filed Jun. 7, 1990, Ser. No. 534,440
Int. Cl.[5] A23F *3/18*
U.S. Cl. 426—597 9 Claims

1. A process for obtaining water-soluble tea extracts comprising hydrolyzing spent tea residue, wherein the spent tea residue has been obtained from tea leaves extracted by a hot aqueous medium, with an acid catalyst at a temperature of from 170° C. to 250° C. at a pressure of from 120 psig to 600 psig for from 5 seconds to 120 seconds to obtain an extract and then separating the extract from insoluble residue.

5,069,926

METHOD FOR MODIFYING THE SURFACE OF A POLYMER ARTICLE

Hiroo Iwata, Suita; Yoshiyuki Miyaki, Yamato, and Hiroaki Nakamura, Ebina, all of Japan, assignors to Tosoh Corporation, Shinnanyo, Japan

Filed Oct. 24, 1990, Ser. No. 602,672
Claims priority, application Japan, Oct. 24, 1989, 1-275001; Dec. 25, 1989, 1-332871
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—40 7 Claims

1. A method for modifying the surface of a polymer article, which comprises applying to the polymer article a macromer having a radical polymerizable double bond, followed by treatment with non-polymerizable plasma, wherein the macromer is an organic compound having a molecular weight of from 500 to 10^6, whereby the organic compound reacts with radicals formed on the surface of the polymer article for graft reaction and is fixed to the surface of the polymer article by a covalent bond.

5,069,927

ADHESIVELY-BONDED COATED COMPOSITES OF HIGHLY SATURATED ELASTOMERS

David F. Lawson, Uniontown, and Lynn A. Bryant, Canton, both of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Continuation of Ser. No. 318,267, Mar. 3, 1989, abandoned. This application Feb. 15, 1991, Ser. No. 657,353
Int. Cl.[5] B05D *3/06*
U.S. Cl. 427—40 9 Claims

1. A process for activating a highly saturated elastomer surface, comprising:

exposing a surface of a highly saturated elastomer to an effective amount of a corona discharge to activate said elastomer surface, said highly saturated elastomer being less than 20 mole percent unsaturated, and

immediately thereafter applying a halogenating agent to said activated elastomer surface at an effective concentration to chemically fix said activated surface.

5,069,928

MICROWAVE CHEMICAL VAPOR DEPOSITION APPARATUS AND FEEDBACK CONTROL METHOD

Hiroshi Echizen, Tokyo, and Satoshi Takaki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1989, Ser. No. 302,244
Claims priority, application Japan, Feb. 1, 1988, 63-21797
Int. Cl.[5] C23C *16/50*
U.S. Cl. 427—45.1 6 Claims

1. A microwave plasma CVD apparatus comprising:

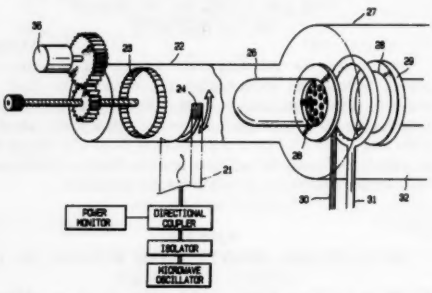
(a) a hermetically sealed vacuum vessel;

(b) raw material gas introducing means for introducing a raw material gas into the vacuum vessel;

(c) evacuating means for evacuating said vacuum vessel; and

(d) microwave introducing means for introducing microwaves through a microwave transmission circuit into said

vacuum vessel to generate a plasma within the vacuum vessel; said microwave transmission circuit including a cavity resonator integrally provided with two matching



circuits; said matching circuits comprising a plunger for varying the length of said cavity resonator and a pair of sliding matching irises.

5,069,929

ACTINIC RADIATION-CURABLE RUST-PREVENTIVE COATING COMPOSITIONS FOR STEEL PRODUCTS

Tetsuzo Arai, Takarazuka; Yasushi Yamamoto, Ashiya; Mitsuyuki Raijo, Nara, and Isao Fujita, Kobe, all of Japan, assignors to Sumitomo Metal Industries, Ltd. and Nippon Paint Co., Ltd., both of Osaka, Japan

Division of Ser. No. 39,766, Apr. 17, 1987, abandoned, which is a continuation of Ser. No. 652,629, Sep. 20, 1984, abandoned. This application Nov. 27, 1989, Ser. No. 442,384

Int. Cl.[5] B05D *3/06; B65D 33/00;* **C08L** *63/10, 67/07*

U.S. Cl. 427—54.1 **7 Claims**

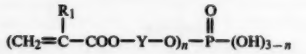
1. A process for temporarily preventing a steel product from rusting by providing said steel product with an ultraviolet radiation-curable, rust-preventive coating composition which is alkaline solution removable, comprising the steps of:

providing a coating composition consisting essentially of:

(A) from 10 to 50 parts by weight of a vinyl polymer formed by polymerization of one or more α,β-ethylenically unsaturated monomers selected from the group consisting of alkyl acrylates and methacrylates, acrylic and methacrylic acid, and styrene and its derivatives, said vinyl polymer having a glass transition temperature of not lower than 5° C., a solubility parameter in the range of from 9 to 11.5, and a number average molecular weight in the range of from 3,000 to 30,000;

(B) from 50 to 90 parts by weight of one or more polymerizable compounds having at least one unsaturated group capable of initiating reaction by ultraviolet radiation in the presence of a photoinitiator;

(C) from 0.1 to 20 parts by weight of one or more organic phosphates of the formula:



$$(CH_2{=}C(R_1)-COO-Y-O)_n-P(=O)-(OH)_{3-n} \quad (I)$$

wherein R_1 is hydrogen or methyl, Y is a straight or branched chain alkylene having about 2 to about 20 carbon atoms which may be interrupted by one or more ester or oxy linages and/or aromatic rings, and n is an integer from 1 to 3; and

(D) one or more photoinitiators provided in an amount of from 0.1% to 10% by weight based on the total weight of the polymerizable compounds (B);

wherein at least one of said one or more α,β-ethylenically unsaturated monomers is a carboxyl-containing one which is present in such an amount that the resulting vinyl polymer (A) has an acid value in the range of from 30 to 120 on a solids basis, and wherein said one or more organic phosphates of (C) are different from said one or more polymerizable compounds of (B);

applying said coating composition to at least one surface of said steel product;

exposing the coating composition consisting essentially of components (A), (B), (C) and (D) to ultraviolet radiation, thereby forming a cured, rust-preventive coating composition removably adhered to said steel product; and

thereafter removing said cured coating composition by treating it with an alkaline solution.

5,069,930

METHOD FOR THE EVAPORATION OF MONOMERS THAT ARE LIQUID AT ROOM TEMPERATURE

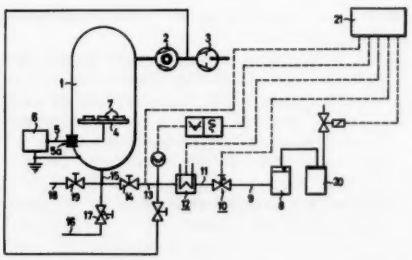
Ingo Hussla, Hanau am Main, and Jochen Ritter, Laubach, both of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Hanau, Fed. Rep. of Germany

Division of Ser. No. 267,077, Nov. 4, 1988, Pat. No. 4,947,789. This application Mar. 29, 1990, Ser. No. 501,230

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1988, 3833232

Int. Cl.[5] C23C *16/00;* **B05D** *3/06*

U.S. Cl. 427—55 **6 Claims**



1. A method for the evaporation of monomers which are liquid at room temperature and have a low vapor pressure in the production of thin coatings containing silicon and oxygen on substrates by chemical vapor deposition in a vacuum chamber, said method comprising the steps of:

selecting a monomer from the group consisting of TEOS (tetraethylorthosilicate), TMS (tetramethyisilane) and HMDS (hexamethyldisiloxane),

feeding the monomer in a liquid state to an evaporator,

providing a body having a capillary action in said evaporator,

controlling the feeding of the monomer to said body using a mass flow regulator, and

heating said body so that complete evaporation of the monomer from said body occurs at the pressure of said vacuum chamber.

5,069,931

METHOD OF PREPARING A MAGNETIC RECORDING MEDIUM

Johannes Gerum, Unterpfaffenhofen; Horst Schulz, Miesbach, and Jürgen Sauter, Munich, all of Fed. Rep. of Germany, assignors to BASF Magnetics GmbH, Werk Munich, Fed. Rep. of Germany

Division of Ser. No. 478,137, Feb. 9, 1990. This application Apr. 16, 1991, Ser. No. 686,425

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1989, 3905910

Int. Cl.[5] H01F *10/02*

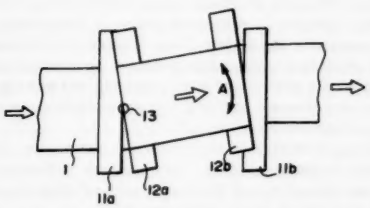
U.S. Cl. 427—128 **11 Claims**

1. A method for preparing a magnetic recording medium, comprising the steps of:

(a) mixing magnetic pigment particles with a solvent and a binder;

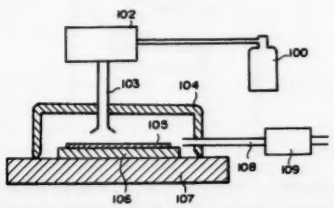
(b) dispersing the mixture;
(c) finely dispersing the dispersed mixture while adding to the mixture at a uniform rate over the whole period of dispersion a dispersion stabilizing component; and
(d) applying the finely dispersed mixture to a layer support to form a magnetic layer.

5,069,932
METHOD OF WINDING UP A MAGNETIC RECORDING MEDIUM
Junji Nakada; Hideaki Takeuchi, and Tadashi Yasunaga, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Apr. 11, 1991, Ser. No. 683,626
Claims priority, application Japan, Apr. 13, 1990, 1-97867
Int. Cl.[5] H01F *10/02*
U.S. Cl. 427—129 **7 Claims**



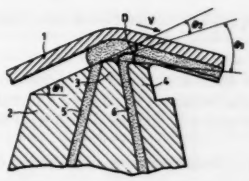
1. A method for winding up a magnetic recording medium comprising winding up on a wind-up roll a continuous polymeric substrate for the magnetic recording medium, on which magnetic material is deposited during which the end portions of both sides of the substrate is masked, in a vacuum atmosphere while the substrate is fluctuated in a width direction by a fluctuating width ranging from 0.2 mm to 40 mm in a fluctuating cycle ranging from 10 seconds to 1000 seconds.

5,069,933
METHOD FOR MAKING MAGNETIC RECORDING MEDIA
Tadashi Yasunaga; Shiro Kaneko, and Kunihiko Sano, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Dec. 27, 1990, Ser. No. 634,663
Claims priority, application Japan, Dec. 27, 1989, 1-339809
Int. Cl.[5] H01F *10/02*
U.S. Cl. 427—130 **5 Claims**



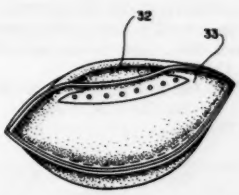
1. A method for making a magnetic recording medium, which comprises the steps of:
i) forming a thin ferromagnetic metal film on a non-magnetic substrate, said thin ferromagnetic metal film containing Co as a main constituent and containing oxygen in a proportion of at least 15 at%, and
ii) thereafter exposing said thin ferromagnetic metal film to an ozone-containing atmosphere.

5,069,934
PROCESS FOR PRODUCING MULTI-LAYERED MAGNETIC RECORDING MEDIA
Naoyoshi Chino; Norio Shibata, and Hiroshi Chikamasa, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan
Filed Dec. 6, 1990, Ser. No. 623,637
Int. Cl.[5] H01F *10/02*
U.S. Cl. 427—131 **9 Claims**



1. In a process for producing a multi-layered magnetic recording medium in which a plurality of organic solvent based dispersions that are non-Newtonian fluids having fine particles dispersed therein are simultaneously applied in superposition onto a continuously running nonmagnetic support using an extrusion type applicator head, the improvement wherein the coating operation is performed in such a way that the Reynolds number, as determined by the average of the kinetic viscosity coefficients of said dispersions, the coating speed and the equivalent diameter during coating, is no more than 400, and that, simultaneously, the yield stress of at least the dispersion for the topmost layer is at least 10 dyne/cm^2.

5,069,935
METHOD OF MAKING WATER-REPELLENT LEATHER GAME BALL
Peter J. Walters, Roselle, Ill., assignor to Wilson Sporting Goods Co., River Grove, Ill.
Filed Nov. 7, 1990, Ser. No. 610,042
Int. Cl.[5] B05D *1/00*
U.S. Cl. 427—209 **17 Claims**



1. A method of making a water-repellent leather game ball having an inflatable bladder and an outer carcass which encloses the bladder, the carcass being formed from a plurality of leather panels which are secured together, the method comprising the steps of:
forming said panels,
applying a coating of water-repellent material to one side of each of the panels,
securing the panels together to form the carcass and positioning the bladder inside the carcass to form the game ball, said one side of each panel facing the bladder and forming the inside surface of the carcass, and
applying a coating of water-repellent material to the outside surface of the carcass.

5,069,936

MANUFACTURING PROTEIN MICROSPHERES

Richard C. K. Yen, 4261 Chase Ave., Los Angeles, Calif. 90066

Continuation-in-part of Ser. No. 66,811, Jun. 25, 1987, abandoned, which is a continuation-in-part of Ser. No. 351,030, Feb. 22, 1982, abandoned. This application Aug. 7, 1989, Ser. No. 390,628

Int. Cl.[5] A61K *9/26, 9/64;* B01J *13/08, 13/20*

U.S. Cl. 427—213.33 24 Claims

1. A process for manufacturing protein microspheres, comprising:

a) dissolving protein molecules in an aqueous buffer solution to form a protein solution;

b) adding a surfactant;

c) adding a desolvating agent to the admixture of protein solution and surfactant to produce a turbid mixture comprising substantially monodispersed protein microspheres; and

d) adding a cross-linking agent to the turbid mixture formed in step c).

5,069,937

THERMAL SPRAYING OF STAINLESS STEEL

Nicholas J. Wall, Cheshire, Great Britain, assignor to Whitford Plastics Limited, Cheshire, Great Britain

PCT No. PCT/GB88/00689, § 371 Date Feb. 26, 1990, § 102(e) Date Feb. 26, 1990, PCT Pub. No. WO89/01534, PCT Pub. Date Feb. 23, 1989

PCT Filed Aug. 22, 1988, Ser. No. 465,132

Claims priority, application United Kingdom, Aug. 20, 1987, 8719716

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—227 18 Claims

15. A method of coating a substrate with a fluorocarbon layer, comprising:

preparing a roughened surface on said substrate by thermally spraying a stainless steel alloy thereon, said stainless steel alloy containing from 25% to 35% by weight of chromium;

coating the metal-coated substrate with a fluorocarbon layer from liquid medium;

drying said coated substrate; and

curing or sintering said substrate.

5,069,938

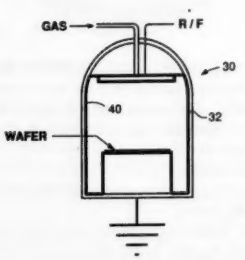
METHOD OF FORMING A CORROSION-RESISTANT PROTECTIVE COATING ON ALUMINUM SUBSTRATE

D'Arcy H. Lorimer, San Luis Obispo, Calif., and Craig A. Bercaw, Hayward, Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Jun. 7, 1990, Ser. No. 534,807

Int. Cl.[5] C23C *16/00*

U.S. Cl. 427—255.1 22 Claims



1. A method of forming a corrosion-resistant protective coating on an aluminum substrate which comprises contacting an aluminum oxide layer on said aluminum substrate with one or more fluorine-containing gases at an elevated temperature.

5,069,939

PROCESS FOR COVERING A SUBSTRATE WITH A CEMENTITIOUS SURFACE HAVING A MOTTLED, SPECKLED APPEARANCE

Gordon McKinnon, 119 S. Oregon Ave., Tampa, Fla. 33606

Continuation of Ser. No. 122,398, Nov. 19, 1987, Pat. No. 4,959,250, which is a continuation-in-part of Ser. No. 861,233, May 7, 1986, Pat. No. 4,721,634. This application May 16, 1990, Ser. No. 524,043

Int. Cl.[5] B05D *3/12, 5/02*

U.S. Cl. 427—262 15 Claims

1. A process for covering a substrate with a cementitious simulated ceramic surface having a mottled, speckled appearance comprising:

providing a cementitious substrate;

mixing cement and sand to form a second mixture;

adding an aqueous solution of an adhesive resin to the second mixture to create a viscous second liquid mortar;

applying the viscous second liquid mortar onto randomly spaced portions of the cementitious substrate to create a noncontiguous thickened cementitious coating having a high viscosity to prevent spreading of the second liquid mortar over the surface of the cementitious substrate;

troweling the noncontiguous thickened cementitious coating to form a plurality of interconnecting and non-interconnecting flattened and level plateaus partially covering the cementitious substrate; and

allowing the troweled coating to cure to reveal the cementitious substrate partially covered with a flattened and shaped pattern over the cementitious substrate simulating a mottled, speckled ceramic covering.

5,069,940

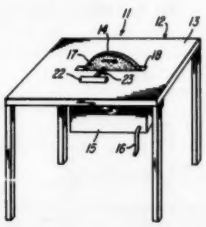
APPARATUS AND METHOD FOR APPLYING COATING MATERIAL

Jarod D. Wenrick, Miami County, Ohio, assignor to Creative Extruded Products, Inc., Tipp City, Ohio

Filed Oct. 1, 1990, Ser. No. 591,391

Int. Cl.[5] B05D *5/00, 1/08;* B05C *1/02*

U.S. Cl. 427—284 18 Claims



1. An apparatus for applying liquid coating material to the end surface of a decorative member, comprising a wheel having a central supporting shaft, means for supplying coating material to at least one side face of said wheel, means for rotating said wheel about said shaft, a flat working surface on which said member is placed, said surface being approximately at right angles to said side face, and means for feeding said member placed on said flat working surface so that said end surface contacts said side face to apply coating material to said end surface.

5,069,941

WATER- AND OIL-REPELLENT ANTIFOULING FINISHING AGENT

Akira Ohmori, Ibaraki; Hiroshi Inukai, Settsu; Takahiro Kitahara, Suita, and Akihiko Ueda, Osaka, all of Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

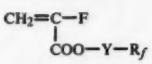
Division of Ser. No. 324,025, Mar. 16, 1989, abandoned. This application Feb. 7, 1991, Ser. No. 652,402

Claims priority, application Japan, Mar. 16, 1988, 63-63840

Int. Cl.[5] B32B *15/00*

U.S. Cl. 427—385.5 5 Claims

1. A method of providing an article surface with anti-fouling properties which comprises applying to said surface a solution of an anti-fouling finishing agent comprising at least 50% by weight of a fluorine-containing acrylate represented by the formula



wherein Y is alkylene group having 1 to 3 carbon atoms, a group of the formula $-CH_2CH_2N(R)SO_2-$ (wherein R is alkyl group having 1 to 4 carbon atoms) or a group of the formula $-CH_2CH(OZ)CH_2-$ (wherein Z is hydrogen atom or acetyl group), and R_f is fluoroalkyl group having 3 to 21 carbon atoms and containing 1 to 10 oxygen atoms in the carbon chain (provided that no oxygen atom is adjacent or closest to other oxygen atom), said fluoroalkyl groups having at least 5 fluorine atoms and drying the applied solution.

5,069,942

PROCESS FOR IMPROVING ADHESION OF POLYSILOXANE COATINGS TO POLYMERIC SUBSTRATES VIA REDUCED ALKALI METAL CATION CONTENT

Jerrel C. Anderson, Vienna, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 516,420, Apr. 30, 1990, abandoned. This application Mar. 21, 1991, Ser. No. 673,066

Int. Cl.[5] B05D *3/02*

U.S. Cl. 427—387 12 Claims

1. A process for improving the adhesion of a polysiloxane coating to a polymeric substrate which comprises treating a coating solution comprised of silica and organic silanol with a cationic exchange resin to remove alkali metal cations, coating at least one surface of said polymeric substrate with said treated coating solution, and thereafter curing said coating at an elevated temperature.

5,069,943

PROCESS FOR PRODUCING MODIFIED MOLDED POLYMER ARTICLE

Shigeyoshi Hara, and Umewaka Nakatani, both of Iwakuni, Japan, assignors to Hercules Incorporated, Wilmington, Del.

Filed Dec. 18, 1989, Ser. No. 451,891

Claims priority, application Japan, Apr. 5, 1989, 1-84639

Int. Cl.[5] B29C *45/00, 71/00*

U.S. Cl. 427—400 13 Claims

2. A method for improving the flame retardance of a molded crosslinked metathesis polymer made up of at least 50 mol% of recurring units derived from dicyclopentadiene, which method comprises contacting said molded polymer article with a halogenated hydrocarbon capable of acting as a strong radical chain transfer agent at a temperature of about 50° to 90° C. about 0.5 to 100 hours.

5,069,944

THERMAL TRANSFER RECORD SHEET

Takashi Yamagishi, Yokohama; Yukito Yamamoto, and Yoji Murakami, both of Sagamihara, all of Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 412,125, Sep. 25, 1989, Pat. No. 4,937,224. This application Mar. 15, 1990, Ser. No. 493,784

Claims priority, application Japan, Sep. 29, 1988, 63-242557; Jul. 7, 1989, 1-174115

Int. Cl.[5] B41M *3/12, 5/035, 5/26*

U.S. Cl. 427—444 2 Claims

1. A process for producing a thermal transfer record sheet comprising a substrate sheet and a dye receptive layer and a non-tacky layer in this order on at least one surface of the substrate sheet; the dye receptive layer being composed of a crosslinking reaction product of a composition comprising (A-1) a saturated polyester, containing units derived from 2, 2-bis(4-hydroxyphenyl)propane in the main chain of the polyester and having a glass transition temperature of at least 60° C. and (A-2) a polyisocyanate compound, and the non-tacky layer (B-1) comprising a water-insoluble or sparingly water-soluble fluorine-containing surface-active agent and (B-2) having a thickness of 50 to 200 angstrom, which comprises heat-treating a pre-sheet comprising the substrate sheet and on at least one surface thereof, a layer composed of the partial crosslinking reaction product of a composition comprising (A-1) the saturated polyester (A-2) the polyisocyanate compound and (B-1) the water-insoluble or sparingly water-soluble fluorine-containing surface-active agent, at a temperature of 40 to 80° C. to promote the crosslinking reaction between the saturated polyester and the polyisocyanate and to promote the migration of the fluorine-containing surface-active agent onto the surface of the dye receptive layer.

5,069,945

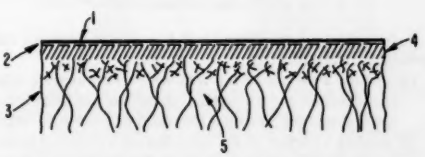
ULTRAPOUS THIN-FILM MEMBRANES

Wolfgang J. Wrasidlo, LaJolla, Calif., assignor to Memtec America Corporation, Timonium, Md.

Division of Ser. No. 920,365, Oct. 20, 1986, Pat. No. 4,814,012, which is a division of Ser. No. 232,930, Aug. 9, 1988, Pat. No. 4,902,424. This application Nov. 21, 1989, Ser. No. 439,935

Int. Cl.[5] B01D *67/00*

U.S. Cl. 427—245 22 Claims



21. The method of increasing the pore size of a cross linked polymer thin film membrane, wherein said polymer is a polyurea or a polyamide, by the steps of forming an aqueous solution of polyamide, by the steps of forming an aqueous solution of hypochlorite, and contacting said thin film membrane with said aqueous solution for a time and at a temperature sufficient to decrease the cross link density of said thin film to an extent sufficient to attain a desired pore size corresponding to molecular weight cutoff values of from at least 500 to at least 1,000,000.

5,069,946

MULTILAYERED PACKAGING MATERIALS HAVING HIGH GAS BARRIER PROPERTY

Tohei Moritani; Susumu Fukutome; Yasuo Motoishi, and Hidemasa Oda, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Division of Ser. No. 291,732, Dec. 29, 1988, Pat. No. 4,999,229. This application Dec. 21, 1990, Ser. No. 631,672

Claims priority, application Japan, Dec. 29, 1987, 63-335823; Feb. 1, 1988, 63-22580

Int. Cl.[5] B29D *22/00*

U.S. Cl. 428—36.6 4 Claims

1. A food package obtained by filling a food in a multilayered packaging material comprising

a barrier layer adapted to contact a moist environment during retort or boil sterilization procedures, comprising 55–97% by weight of an ethylene vinyl alcohol polymer having an ethylene content of 20–50 mol % and 45 to 3% by weight of a resin selected from the group consisting of polyamide resin, polyolefin resin, polyester resin and polycarbonate resin; and

a layer of a hydrophobic thermoplastic resin having a low moisture permeability in contact therewith wherein said barrier layer is the outer layer and said thermoplastic resin is the inner layer of said multilayered packaging material and said barrier layer is adapted for direct contact with said moist environment and then boil or retort sterilizing the package containing the food.

5,069,947

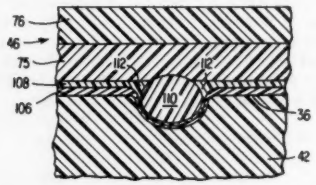
METHOD FOR LAMINATING A PLASTIC WEB ONTO A PLASTIC SUBSTRATE

Siegfried Hopperdietzel, Selb, Fed. Rep. of Germany, assignor to Rehau AG & Co., Rehau, Fed. Rep. of Germany

Filed May 17, 1989, Ser. No. 354,441

Int. Cl.[5] B44C *5/08*

U.S. Cl. 428—38 24 Claims



1. A process for attaching a web to a plastic substrate, comprising the steps of:

(a) coating a surface of the web with a first mixture which includes resin and solvent for the resin of the first mixture, the first mixture having a first ratio of solvent to resin;

(b) coating a surface of the substrate with a second mixture which includes resin and solvent for the resin of the second mixture, the second mixture having a second ratio of solvent to resin, the second ratio being substantially different from the first ratio; and

(c) laminating the web to the substrate by pressing the coated surfaces together and applying heat,

wherein the substrate is made of polyvinyl chloride, wherein the web includes a polymer layer and a weatherproof covering layer bonded to the polymer layer, and wherein step (a) is conducted by coating the polymer layer of the web with the first mixture.

5,069,948

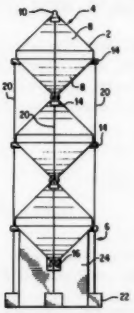
STRUCTURAL UNIT HAVING HINGEDLY CONNECTED TETRAHEDRONS

Howard A. Fromson, P.O. Box 1318, Rockville, Conn. 06066

Filed Aug. 2, 1990, Ser. No. 561,962

Int. Cl.[5] B32B *1/04*

U.S. Cl. 428—54 10 Claims



1. An elongate structure comprised of a plurality of tetrahedral elements linearly arranged, said structure having a fixed end and an opposed free end,

each tetrahedral element comprising four triangular faces, two of said faces meeting at a first rectilinear edge extending between a first pair of opposed apices, the other two of said faces meeting at a second rectilinear edge extending between a second pair of opposed apices,

the first rectilinear edge of at least one of said tetrahedral elements being hingedly connected to the second rectilinear edge of a further said tetrahedral element, the second edge of said at least one element being hingedly connected to the first edge of a still further said tetrahedral element,

a pair of guides at respective opposed apices of one of said first and second rectilinear edges, said guides being shared by first and second edges which are hingedly connected,

four cable elements fixed to respective apices at the free end of the structure, each cable element passing through guides which are linearly aligned as seen along the length of the structure,

the shape of the elongate structure may be controlled by controlling the tension in the cable means at the fixed end of the elongate structure.

5,069,949

MAGNETIC RECORDING MEDIUM

Atsuko Matsuda, and Narito Goto, both of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jul. 11, 1989, Ser. No. 378,165

Claims priority, application Japan, Jul. 14, 1988, 63-175682

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—141 2 Claims

1. A magnetic recording medium having a support and provided thereon a magnetic layer, wherein said support comprises physical properties of:

a. a thickness: not more than 15.5 μm,

b. a number of a protuberance having a height of not lower than 0.1 μm: not more than 30/mm^2,

c. a surface roughness (Rz): 0.04 to 0.09 μm,

d. a Young's modulus in a machine direction: not less than 550 kg/mm^2,

e. a fracture strength in a machine direction: not less than 30 kg/mm^2, and

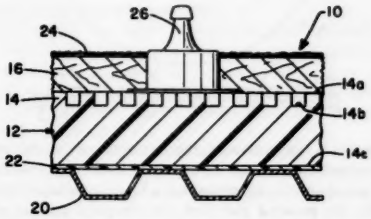
f. an elongation: not less than 60%,

said magnetic layer comprising ferromagnetic particles dispersed in a binder comprises physical properties of:

g. a surface roughness (Rz): not more than 0.09 μm,

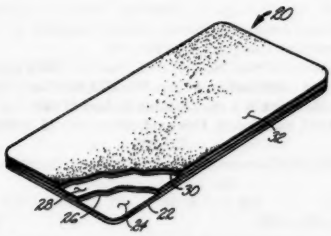
h. a Young's modulus in a machine direction: not less than 400 kg/mm^2.

5,069,950
INSULATED ROOF BOARD
Anthony J. Crookston, Sr., Akron, Ohio, assignor to Old Reliable Wholesale, Inc., Barberton, Ohio
Filed Apr. 11, 1990, Ser. No. 508,066
Int. Cl.^{5} B05B *5/00*
U.S. Cl. 428—156 7 Claims



1. A composite insulated roof board structure comprising:
(a) an insulated roof board member comprising (1) a main portion of rigid coherent solid insulating material, and (2) a top portion comprising a plurality of spaced blocks above said main portion and integral therewith, said blocks defining therebetween a network of interconnected channels at the same level for horizontal venting of water vapor; and
(b) a relatively hard, dense protective top layer which is adhered to the tops of the blocks of said insulated roof board member.

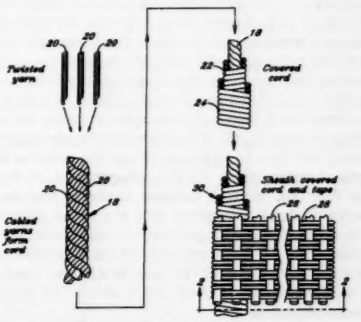
5,069,951
MAGNETIZED BATH MAT
Eugene P. Egan, 4175 Eastwood Dr., Sarasota, Fla. 34232
Filed Aug. 24, 1989, Ser. No. 397,981
Int. Cl.^{5} B32B *3/00;* A47K *3/02*
U.S. Cl. 428—172 4 Claims



1. A slip resistant magnetized bath mat removably connectable atop the magnetically attracted bottom of a bathtub or shower stall, said bath mat comprising:
a thin, non-porous, homogeneous, flexible magnetic base sheet having generally smooth top and bottom surfaces and permanently magnetized so that said base sheet bottom surface is releasably attractable to the tub or shower bottom only by said base sheet to provide a high degree of slip resistance between said bath mat and the tub or shower bottom during normal use;
a thin, non-porous, flexible, non-magnetic, homogeneous, upper sheet having a generally smooth bottom surface permanently adhered atop and generally coextensive with said base sheet;
said upper sheet having a textured top surface which is generally slip resistant to a user standing or sitting there atop under wet conditions;
a very thin, non-porous, homogeneous, flexible intermediate sheet having an opaque coloring generally shaded similar to that of said upper sheet and permanently adhered between, and generally coextensive with, said upper and base sheets;
said intermediate preventing visual bleeding of the color of said base sheet through to said upper sheet.

2. A slip resistant magnetized bath mat removably connectable atop the magnetically attracted bottom of a bathtub or shower stall, said bath mat comprising:
a thin, non-porous, flexible, homogeneous, non-magnetic upper sheet having a generally smooth bottom surface and a textured top surface which is generally slip resistant to a user standing or sitting there atop under wet conditions;
a thin, porous, homogeneous, permanently magnetic base perimeter strip having an upper surface permanently adhered, and extending along at least a portion of the perimeter of said upper sheet and having a generally smooth bottom surface;
said base strip permanently magnetized so that said base strip bottom surface is releasably attractable to the tub or shower bottom only by said base strip to provide a high degree of slip resistance between said bath mat and the tub or shower bottom during normal use;
a very thin, non-porous, homogeneous, flexible intermediate sheet having an opaque coloring generally shaded similar to that of said upper sheet and permanently adhered between, and generally coextensive with, said upper and base sheets;
said intermediate preventing visual bleeding of the color of said base sheet through to said upper sheet.

5,069,952
ZIPPER TAPE
Terri P. Gruenenfelder, Gainesville, Ga., assignor to Scovill Fasteners Inc., Clarkesville, Ga.
Filed Apr. 22, 1991, Ser. No. 688,243
Int. Cl.^{5} B32B *23/02*
U.S. Cl. 428—193 2 Claims



1. A tape for zippers comprising a woven web having a beaded edge, the beaded edge comprising:
a. a cord consisting of a plurality of tightly packed untextured filament yarns of Nylon, each yarn being twisted in a first direction, the cord then twisted in the opposite direction to form a balanced cable,
b. an inner and an outer covering yarn wound around the cord, the covering yarn having texture, the inner and the outer covering yarns being tightly wound in opposite directions, and
c. a sheath covering the cord and covering yarns, the sheath consisting of interlaced warp and weft threads of the woven web,
whereby when the zipper teeth are clamped onto the beaded edge, the sheath and covering yarns will protect the cord from

contact with the teeth and the covering yarns help protect the cord from attack by laundry solutions.

5,069,953

HEAT-SHRINKABLE FOAMED COMPOSITE FILM AND PROCESS FOR PREPARATION OF SAME

Nobutaka Kishikawa, Shiga; Akira Mita, and Mitsugi Satou, both of Moriyama, all of Japan, assignors to Gunze Limited, Ayabe, Japan

Continuation of Ser. No. 547,366, Jul. 3, 1990, abandoned. This application Dec. 17, 1990, Ser. No. 627,912

Claims priority, application Japan, May 17, 1990, 2-127556

Int. Cl.[5] B32B *3/26*

U.S. Cl. 428—201 **3 Claims**

1. heat-shrinkable foamed composite film which is a film laminate composed of:

(A) a laterally monoaxially-oriented foamed film of an olefin polymer having a thickness of about 40 to about 400 μm, the film being heat-shrinkable predominantly in a lateral direction and being formed from a composition comprising (i) 100 parts by weight of a mixture of about 55 to about 90% by weight of at least one olefin copolymer selected from ethylene-propylene copolymers and ethylene-propylene-α-olefin copolymers (the α-olefin having 4 to 6 carbon atoms) having an ethylene content of about 2 to about 10 mole % and about 10 to about 45% by weight of at least one ethylene polymer selected from low-density polyethylenes and ethylene-vinyl acetate copolymers having a vinyl acetate content of up to about 30% by weight; and (ii) about 0.2 to about 5 parts by weight of a foaming agent,

(B) a laterally monoaxially-oriented film of an olefin polymer having a thickness of about 5 to about 50 μm, the film being heat-shrinkable predominantly in a lateral direction and being formed from a composition comprising an olefin polymer, and

(C) a laterally monoaxially-oriented printed polyester film having a thickness of about 5 to about 50 μm, the film being heat-shrinkable predominantly in a lateral direction and being formed from a composition comprising a polyester mixture of about 60 to about 90% by weight of a polyester copolymer and about 10 to about 40% by weight of polyethylene terephthalate, the polyester copolymer being prepared from terephthalic acid and/or a derivative thereof as an aromatic dicarboxylic acid component and ethylene glycol and 1,4-cyclohexanedimethanol as a diol component, the amount of 1,4-cyclohexanedimethanol in the diol component being about 15 to about 45 mole %, the film laminate being formed by laminating the films (A), (B) and (C) in this order so that the printed surface of the film (C) is disposed face-to-face with the film (B), the film laminate having a heat shrinkage factor of about 25 to about 50% in a lateral direction and 0 to about 10% in a longitudinal direction under the conditions of 100° C. for 30 seconds and has a Young's modulus of about 40 to about 170 kg/mm^2 in a lateral direction and a tensile strength of about 5.0 to about 15.0 kg/cm in a lateral direction.

5,069,954

TRANSFER FOR AUTOMATIC APPLICATION

Donald Cole, Congleton, and Robert W. Smith, Stoke-on-Trent, both of United Kingdom, assignors to 501 Johnson Matthey Public Limited Company, London, England

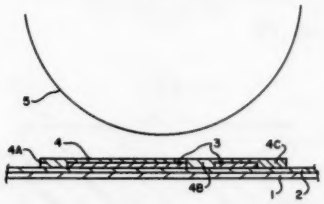
Filed Jan. 28, 1988, Ser. No. 149,355

Claims priority, application United Kingdom, Jan. 30, 1987, 8702063

Int. Cl.[5] B32B *3/00, 7/00*

U.S. Cl. 428—202 **5 Claims**

1. A ceramic transfer for use with automatic offset application equipment wherein the transfer is applied to ware by means of a printing pad, the transfer comprising, in sequence, a backing paper, release layer, design layer and covercoat layer, in which the covercoat layer is formed from a heat-activatable adhesive and extends over an area greater than that of the design layer so as to cover the design layer and provide a marginal portion of the covercoat layer which is in direct contact with the release layer, and the design layer is formed from a printing ink the medium of which has heat-activatable adhesive properties, the covercoat layer being such that when



its adhesive is heat-activated, the marginal portion thereof has a lower coefficient of adhesion to the release layer than for the printing pad and the covercoat has a lower coefficient of adhesion for the printing pad than the marginal portion of the covercoat and the design layer have for the ware so that the design layer can be separated from the release layer and transferred to the ware by the pad.

5,069,955

FILM AND BLENDS OF POLYETHERAMIDE BLOCK COPOLYMER AND ETHYLENE VINYL ALCOHOL

Samuel W. Tse; George O. Schroeder, both of Appleton, Wis., and Teruo Iwanami, Ibaraki, Japan, assignors to American National Can Company, Chicago, Ill.

Continuation of Ser. No. 747,385, Jun. 21, 1985, abandoned, which is a continuation of Ser. No. 670,302, Nov. 14, 1984, abandoned, which is a continuation-in-part of Ser. No. 588,820, Dec. 8, 1983, abandoned. This application Jan. 25, 1990, Ser. No. 471,009

The portion of the term of this patent subsequent to Jan. 5, 2005, has been disclaimed.

Int. Cl.[5] B32B *27/08, 27/28*

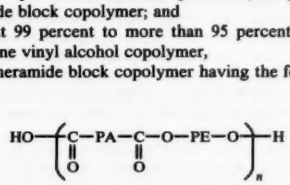
U.S. Cl. 428—213 **74 Claims**

1. As a composition of matter, a polymeric blend, comprising:

(a) about 1 percent to less than 5 percent by weight polyetheramide block copolymer; and

(b) about 99 percent to more than 95 percent by weight ethylene vinyl alcohol copolymer,

the polyetheramide block copolymer having the formula:



wherein PA is a polyamide and PE is a polyether, n being an integer indicative to the degree of polymerication of the block copolymer, the degree of polymerication being such that its Shore Hardness is about 65D to 60A.

5,069,956

MULTILAYER COATING FOR THE INTERIOR SURFACE OF A CAN

Masahiro Murata; Yukiyasu Tanaka, and Tomoo Kokawa, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Hyogoken, Japan

Filed May 30, 1990, Ser. No. 530,392
Claims priority, application Japan, May 30, 1989, 1-136899; May 30, 1989, 1-136900
Int. Cl.[5] B32B *27/38;* C08L *63/00*
U.S. Cl. 428—216 12 Claims

1. A multilayer coating for the interior surface of a can, said coating being consisting essentially of

(A) a primer coat layer having a dry film thickness of not more than 1 micrometer formed by using a thermosetting paint consisting essentially of 59 to 98% by weight of a resol-type phenolic resin and 5 to 50% by weight of an epoxy-type resin having compatibility with the phenolic resin as a binder, and

(B) an overcoat layer formed by overcoating a thermosetting paint to a dry film thickness of 2 to 20 micrometers, said thermosetting paint being selected from the group consisting of

(a) an organic solvent-base thermosetting paint having a binder component composed of 50 to 95% by weight of an aromatic epoxy resin and 5 to 50% by weight of a resol-type phenolic resin,

(b) a water-soluble or water-dispersible thermosetting paint having a binder component composed of an epoxy-acrylate resin which is a reaction product between a carboxyl-containing acrylic resin and an aromatic epoxy resin, and

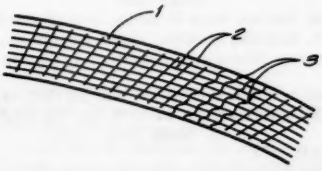
(c) a water-soluble or water-dispersible thermosetting paint having a binder component composed of 50 to 99% by weight of an epoxy-acrylate resin which is a reaction product between a carboxyl-containing acrylic resin and an aromatic epoxy resin, and 1 to 50% by weight of a resol-type phenolic resin.

5,069,957

FIRE RESISTANT ELASTIC STRAP

Edmond Vandermeersch, Comines, Belgium, assignor to S.A.R.L. "Matiba-Manufactures de Tissus", Wervicq-Sud, France

Filed Nov. 1, 1990, Ser. No. 607,517
Claims priority, application France, Dec. 22, 1989, 89 17283
Int. Cl.[5] D03D *3/00*
U.S. Cl. 428—230 9 Claims



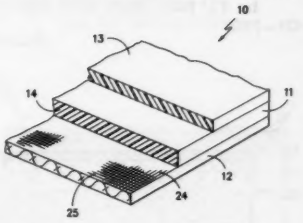
1. Fire resisting elastic strap, designed in particular for furnishing purposes for use in the making of seat or bed suspensions, meeting criteria for safety in the event of fire, the said strap (1) being formed by weaving elastic threads placed in a warp (2) and/or in a weft (3), characterized by the fact that the elastic thread has a core (4) of elastic material and a continuous, longitudinally deformable cladding (5) of fire resisting material.

5,069,958

PRINTER'S BLANKET

Alonzo M. Burns, Jr., Inman, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed May 29, 1990, Ser. No. 529,318
Int. Cl.[5] D03B *3/00, 15/00;* D04B *1/00;* D04H *13/00*
U.S. Cl. 428—246 6 Claims



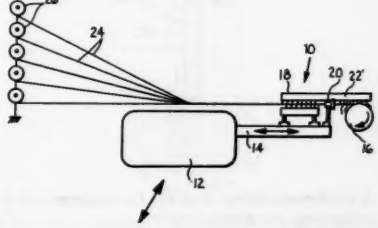
1. A printer's blanket comprising: a woven base ply, a rubber printing face and a compressible body disposed between said base ply and said rubber printing face, said base ply being composed of substantially 100% polyester yarns with the warp yarns and the fill yarns being air textured to provide stability to said printing blanket.

5,069,959

STRUCTURAL COMPOSITES OF FLUOROPOLYMERS REINFORCED WITH CONTINUOUS FILAMENT FIBERS

Wayne F. Gentile, Newark, Del., and Harvey L. Kliman, Chadds Ford, Pa.; William H. Krueger, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 394,695, Aug. 16, 1989, Pat. No. 4,975,321, which is a continuation-in-part of Ser. No. 209,085, Jun. 20, 1988, abandoned. This application Oct. 9, 1990, Ser. No. 592,178
The portion of the term of this patent subsequent to Dec. 4, 2007, has been disclaimed.
Int. Cl.[5] D04H *3/02;* B32B *27/00*
U.S. Cl. 428—294 1 Claim



1. A composite comprising: a matrix PFA (perfluoroalkoxy) fluorocarbon resin having a melt flow index of from about 2 to about 30 reinforced with continuous filament fibers, said matrix resin being from about 30% to about 70% by volume of said composite, said composite having a flex modulus above 5 million psi.

5,069,960

SKIN-SURFACED FOAM GLASS TILE

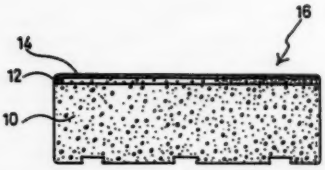
Katsuhisa Fukumoto, Tokoname; Kiyotaka Kawanishi, Nagoya; Ryo Nakada, Tsuchiura, and Junpei Yamano, Nagoya, all of Japan, assignors to Inax Corporation, Japan

Continuation-in-part of Ser. No. 235,372, Aug. 23, 1988. This application Jan. 16, 1991, Ser. No. 642,072

Claims priority, application Japan, Aug. 26, 1987, 62-212457; Aug. 27, 1987, 62-213673; Aug. 27, 1987, 62-213674

Int. Cl.[5] B32B *18/00, 5/14, 3/26*

U.S. Cl. 428—310.5 16 Claims



1. A thermally insulating foam glass tile comprising,

a tile-like body consisting essentially of a first vitrifiable mineral and having a first volume of closed cells, and

a rigid reinforcing skin layer consisting essentially of a vitrified mixture of said first vitrifiable mineral and a vitrifying agent for said first vitrifiable mineral permeated into at least a top surface of said tile-like body.

2. The foam glass tile as claimed in claim 1, wherein there is a gradual transition from said skin layer to said tile-like body.

5,069,961

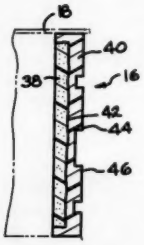
PRE-FORMED MILLWORK ARTICLE

Merle G. Beck, and Randall S. Beck, both of Archbold, Ohio, assignors to Style-Mark, Inc., Archbold, Ohio

Continuation of Ser. No. 282,619, Dec. 12, 1988, abandoned. This application Nov. 30, 1990, Ser. No. 621,250

Int. Cl.[5] B32B *3/26*

U.S. Cl. 428—316.6 4 Claims



1. A pre-formed millwork article for attachment to a structure comprising, in combination:

(a) a core comprised of a rigid filler material;

(b) a body comprised of a rigid foamed material, said body having an inner surface and an outer surface, said inner surface being molded adjacent said core; and

(c) an exterior layer comprised of paint molded adjacent said outer surface of said body.

5,069,962

BIAXIALLY ORIENTED LAMINATED FILM

Iwao Okazaki; Koichi Abe, both of Kyoto, and Shoji Nakajima, Otsu, all of Japan, assignors to Toray Industries, Inc., Japan

Filed Jun. 8, 1989, Ser. No. 363,506

Int. Cl.[5] B32B *5/16*

U.S. Cl. 428—323 18 Claims

1. A biaxially oriented laminated film comprising:

a first layer containing a first thermoplastic resin as a major constituent; and

a second layer containing a second thermoplastic resin comprising a crystalline polyester as a major constituent, which is formed on at least one surface of the first layer, the second layer containing inert particles with an average diameter of 0.5 to 5 times the thickness of the second layer, the content of the inert particles in the second layer being 0.5–50% by weight, the thickness of the second layer being 0.005–3 μm, and said crystalline polyester having a crystallization index of attenuated total reflection Raman of its surface which is up to but not more than 20 cm^{-1}.

5,069,963

MAGNETIC RECORDING MEDIUM WITH A BACK COAT LAYER OF NITROCELLULOSE AND POLYURETHANE BINDER RESINS AND WHICH CONTAINS CARBON BLACK AND TITANIUM DIOXIDE PARTICLES

Hidetoshi Yanai, and Akira Ishikawa, both of Tochigi, Japan, assignors to KAO Corporation, Tokyo, Japan

Filed Aug. 30, 1990, Ser. No. 575,014

Claims priority, application Japan, Sep. 4, 1989, 1-229077

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—323 4 Claims

1. A magnetic recording medium for use in a belt-driven cartridge, which comprises a non-magnetic support provided a magnetic layer on the principal surface thereof and a back coat layer on the opposite surface thereof, wherein said back coat layer comprises:

(a) a carbon black having a mean grain diameter of 20 to 100 nm;

(b) a titanium oxide having a mean grain diameter of 100 to 600 nm; and

(c) a binder consisting essentially of a pyroxylin and a polyurethane resin, with the proviso that the weight proportion of component (a) to component (b) is in the range of 99:1 to 60:40, that the weight proportion of the sum of component (a) and component (b) to component (c) is in the range of 50:50 to 30:70, and that the weight proportion of pyroxylin to polyurethane resin in component (c) is in the range of 10:90 to 90:10.

5,069,964

FLEXIBLE, SUBSTRATE-INSULAR RETROREFLECTIVE SHEETING

Howard R. Tolliver; Terry R. Bailey, both of Woodbury, and David L. Bergeson, Mendota Heights, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 356,079, May 23, 1989, abandoned. This application Feb. 22, 1991, Ser. No. 659,530

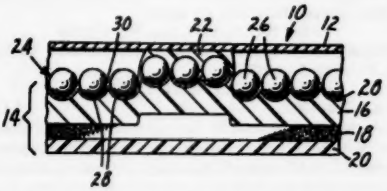
Int. Cl.[5] G02B *5/122, 5/128*

U.S. Cl. 428—325 31 Claims

1. An encapsulated-lens retroreflective sheeting comprising: a) a substantially transparent face member; b) an encapsulating member having a front and a back side, said front side of said encapsulating member and said face member being sealed by a network of interconnecting bonds; and c) retroreflective elements disposed between said face member and said encapsulating member and arranged in substantially a monolayer with an air-interface; wherein

said encapsulating member comprises a plasticizer-resistant

barrier layer, said barrier layer comprising at least one of the following: polyester, nylon, polyvinylidene dichloride, ethylene vinyl alcohol, fluoropolymer, or metal film, and being substantially impermeable to monomeric plasticizers, and



said sheeting is sufficiently flexible to be wrapped around a ½ inch mandrel at a temperature of about 0° C., and has an impact-resistance of at least 40 inch-pounds at 0° C.

5,069,965

ARTICLES HAVING IMPROVED SLIP COATINGS

Pascal E. Esemplare, Mountainside, N.J., assignor to Bioresearch, Inc., Farmingdale, N.Y.

Continuation-in-part of Ser. No. 423,347, Oct. 18, 1989, abandoned. This application Mar. 23, 1990, Ser. No. 497,699

Int. Cl.[5] B32B *25/08*

U.S. Cl. 428—330 **27 Claims**

1. A formed article comprised of outer and inner rubber or vinyl resin surfaces, at least one of said outer and inner surfaces having an essentially rubber-free extensible adherent slip coating selected from the group consisting of (i) a first film-forming copolymer resin Component A comprising the reaction product of about 55 to 80 moles % of at least one copolymerizable vinyl halide, about 15 to 32 mole % of at least one copolymerizable ethylenically unsaturated hydrocarbon and about 3 to 10 mole % of at least one copolymerizable ethylenically unsaturated monomer containing a carboxyl or amido group; (ii) a film-forming copolymer resin Component B comprising the reaction product of 76 to 94 mole % of at least one copolymerizable vinyl or vinylidene halide, about 4 to 12 mole % of acrylonitrile and about 2 to 12 mole % of at least one acrylic monomer; and (iii) a film forming mixture of Component A and Component B.

5,069,966

ORGANIC COATING FOR METALS

Ferdinando Colaiacovo, Rome; Domenico Derchi, Pomezia, and Massimo Memmi, Rome, all of Italy, assignors to Centro Sviluppo Materiale SpA, Rome, Italy

Filed May 18, 1989, Ser. No. 353,525

Claims priority, application Italy, May 18, 1988, 47977 A/88

Int. Cl.[5] B32B *15/08*

U.S. Cl. 428—336 **5 Claims**

1. A metal member having a surface continuous coating thereon consisting essentially of cured epoxy resin having a thickness of up to 2 μm, an epoxy equivalent between 500 and 2,000, that cures at temperatures no higher than 200° C., that has an ultimate elongation greater than 10% and an electrical insulation resistance less than 2,000 Ohm/cm^2.

5,069,967

MAGNETIC RECORDING MEDIUM

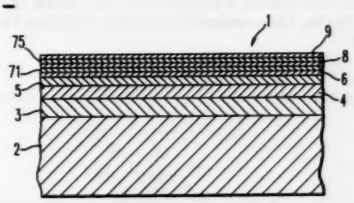
Kenji Yokoyama; Masatoshi Nakayama; Toru Shimozawa; Kunihiro Ueda, and Fumio Maruta, all of Nagano, Japan, assignors to TDK Corporation, Tokyo, Japan

Division of Ser. No. 46,317, May 6, 1987, Pat. No. 4,880,687. This application Aug. 1, 1989, Ser. No. 387,827

Claims priority, application Japan, May 9, 1986, 61-106148; May 9, 1986, 61-106149; May 9, 1986, 61-106150; May 9, 1986, 61-106151; May 9, 1986, 61-106152

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—336 **14 Claims**



1. A magnetic recording medium comprising:
a nonmagnetic substrate having opposed major surfaces,
a metal thin film magnetic layer on one major surface of the substrate,
a plasma-polymerized film on the magnetic layer, and
a topcoat layer having a thickness of from 3 to 300 Å comprising an organic fluorine compound in an amount of at least 50% by weight on the plasma-polymerized film,
the plasma-polymerized film comprising carbon, hydrogen, and at least one of nitrogen and oxygen, and having a thickness of 3 to 300 Å,
an atomic ratio of C/H of from 1:1 to 1:6, and a combined content of nitrogen and/or oxygen of 2 to 40 atoms %,
wherein the plasma-polymerized film is prepared by activating a gaseous reactant into a plasma to generate active species thereof while feeding the reactant into a plasma zone with W/F.M set to 10^7 to 10^{15} joule/kg wherein W is an input power applied for plasma generation, F is the flow rate of the gas reactant and M is the molecular weight of the gas reactant.

5,069,968

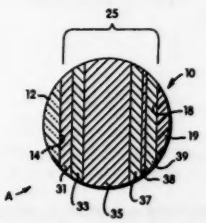
LAMINATED GLAZING UNIT HAVING IMPROVED INTERFACIAL ADHESION

Kenneth E. Nietering, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 20, 1990, Ser. No. 631,112

Int. Cl.[5] B32B *17/06*

U.S. Cl. 428—336 **14 Claims**



1. A laminated glazing unit comprising a substrate ply, a substantially transparent coating comprising a film stack on a surface of the substrate ply, and a laminating ply of polymeric material laminated to the surface of the substrate ply over the film stack, wherein the film stack comprises:
(i) a dielectric film adjacent to the laminating ply, consisting essentially of tantalum pentoxide;

(ii) an film adjacent to the tantalum pentoxide dielectric film, consisting essentially of metal selected from the group consisting of copper and zinc; and

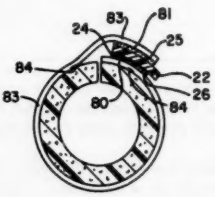
(iii) an electrically conductive film adjacent to and substantially thicker than the adhesion film, consisting essentially of silver metal.

5,069,969

PRESSURE SENSITIVE ADHESIVE TAPE WITH CENTRAL RELEASE LINER

Jack M. McClintock, Pittsburgh, Pa., and Gerald H. Knittel, Brecksville, Ohio, assignors to Morgan Adhesives Co., Stow, Ohio

Filed Feb. 28, 1990, Ser. No. 487,396
Int. Cl.[5] B32B 7/12; F16L 9/00
U.S. Cl. 428—36.5 12 Claims



1. An insulation construction comprising an elongated insulation member having a longitudinal slit therein to allow the insulation to be fitted on or around a shaped article by an adhesive construction positioned in said slit, said adhesive construction comprising a center liner having a first and second side with a layer of removable pressure sensitive adhesive coated on the first side of said liner and removably adhered to a first face of the slit, a layer of permanent adhesive adhered to a second face of the slit and covering a layer of release coated on the liner so as to allow the second side of the center liner to be removed and first and second face of the slit to be adhered together by said permanent adhesive.

5,069,970

FIBERS AND FILTERS CONTAINING SAID FIBERS

Theodore Largman, Morristown; Frank Mares, Whippany, both of N.J., and Clarke A. Rodman, East Providence, R.I., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 300,194, Jan. 23, 1989, Pat. No. 4,908,052.
This application Dec. 18, 1989, Ser. No. 451,704
Int. Cl.[5] D02G 3/00
U.S. Cl. 428—373 31 Claims

1. A fiber comprising a continuous phase of one or more melt processible polyesters of fiber forming molecular weight and one or more melt processible polyolefins selected from the group consisting of polypropylene, polybutylene and polyisobutylene non-uniformly dispersed therein, wherein the weight percent of polyolefin within 50 Å of the surface of said fiber is at least about 50 weight percent based on the total weight of said fiber within said about 50 Å of the surface of the fiber.

5,069,971

SILANE COUPLING AGENT AND GLASS FIBER PRODUCT FOR LAMINATES

Hideharu Waketa; Yoshiharu Suzuki; Motoharu Murakoshi, all of Fukushima; Hideaki Kakiuchi, Saitama; Masuhito Ohgushi, Kumamoto; Kenichi Watanabe, and Toshiya Sawai, both of Kanagawa, Japan, assignors to Nitto Boseki Co., Ltd. and Chisso Corporation, both of, Japan

Filed Nov. 7, 1989, Ser. No. 432,856
Claims priority, application Japan, Nov. 8, 1988, 63-280417; Aug. 24, 1989, 1-216025
Int. Cl.[5] B32B 17/04
U.S. Cl. 428—391 17 Claims

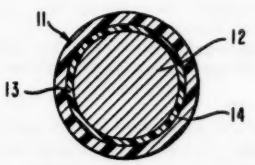
1. A glass fiber product for laminates comprising a glass fiber material treated with a silane coupling agent prepared by reacting 2.3 to 4.0 mols of a haloalkylalkoxysilane with 1 mole of a diamine having N atoms to which 4 active hydrogen atoms are bound.

5,069,972

MOLDABLE MICROCAPSULE THAT CONTAINS A HIGH PERCENTAGE OF SOLID CORE MATERIAL, AND METHOD OF MANUFACTURE THEREOF

Ronald J. Versic, 1601 Shafor Blvd., Oakwood, Ohio 45419

Filed Sep. 12, 1988, Ser. No. 243,410
Int. Cl.[5] H01F 1/00, 1/26; B01J 13/02
U.S. Cl. 428—407 19 Claims



1. A moldable microcapsule comprising:

(a) a solid core;

(b) a conformal, insulating inner layer of parylene encapsulating the core and being free of pinholes; and

(c) an outer layer encapsulating the inner layer and the core, the outer layer comprising a moldable material that has a melting temperature less than that of the inner layer and is tied to the particle by the inner layer, the inner layer having a volume not substantially greater than 8% of the total volume of the microcapsule, and the outer layer having a volume not substantially greater than 24% of the total volume of the microcapsule, and the combined volume of both layers being not substantially greater than 25% of the total volume of the microcapsule.

5,069,973

MAGNETIC RECORDING MEDIUM

Osamu Saito, Takatsuki, and Kenji Sumiya, Suita, both of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Continuation of Ser. No. 857,321, Apr. 30, 1986, abandoned.
This application Jan. 26, 1989, Ser. No. 302,043
Claims priority, application Japan, May 1, 1985, 60-94749
Int. Cl.[5] G11B 23/00
U.S. Cl. 428—421 6 Claims

1. A magnetic recording medium comprising a substrate, a magnetic layer formed on at least one surface of said substrate, and a lubricant, said lubricant being present on or in said magnetic layer, and said lubricant comprises at least one of a fluorine-containing solid compound of the formula:

$$C_nF_{2n+1}-(X)_m-Y \quad (I)$$

and

-continued

$$(C_nF_{2n+1}-(X)_m-O)_p-\underset{\underset{O}{\|}}{P}-(OZ)_{3-p} \quad \text{(II)}$$

$$C_nF_{2n+1}-(X)_m-Y \quad \text{(I)}$$

and

$$[C_nF_{2n+1}-(X)_m-O]_p-\underset{\underset{O}{\|}}{P}-(OZ)_{3-p} \quad \text{(II)}$$

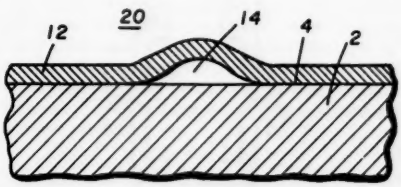
wherein X is a divalent group not containing fluorine, Y is a hydrophilic group or a monovalent group having a terminal carbon-carbon double bond, Z is a hydrogen atom or a metal atom, n is an integer of 3 or more, m is 0 or 1, and p is 2 or 3, provided that, in formula (I), when m is 0, Y is a phosphoric acid group, an acryloyloxy group, metal salts of these groups or a monovalent organic group including one of these groups, or a metal salt thereof.

5,069,974

METALS COATED WITH PROTECTIVE COATINGS OF ANNEALED PERFLUORINATED CATION-EXCHANGE POLYMERS AND METHOD FOR MAKING SAME

David C. Silverman, Chesterfield, Mo.; Judith A. Lefelar, Somers, Conn., and Patrick J. Kinlen, High Ridge, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Feb. 6, 1989, Ser. No. 306,764
Int. Cl.[5] B32B *15/08*
U.S. Cl. 428—422 **3 Claims**



1. An article resistant to localized corrosion resulting from anionic attack thereof, said article comprising:

a metal substrate, said substrate comprising a metal selected from the group consisting of passive metals and alloys containing at least one of said passive metals, and

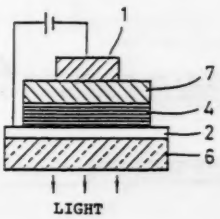
a coating of a perfluorocarbon copolymer cation-exchange polymer over said metal substrate wherein said coating has been annealed to effect a morphological change therein such that the rejection of hostile or interfering anions by said copolymer is improved, said perfluorocarbon copolymer cation-exchange polymer comprising a base copolymer which has been hydrolyzed and/or neutralized to its acid or salt thereof, said base copolymer comprising at least two monomers wherein one monomer is selected from a group consisting of vinyl fluoride, vinylidene fluoride, hexafluoropropylene, trifluoroethylene, chlorotrifluoroethylene, perfluoro-(alkyl vinyl ether), tetrafluoroethylene and mixtures thereof, and a second monomer is selected from the group of monomers containing an $-SO_2F$ or $-COF$ group.

5,069,975

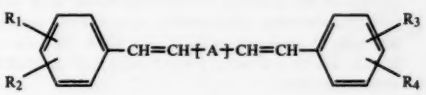
ELECTROLUMINESCENT ELEMENT

Hitoshi Nakada; Takeo Wakimoto; Masanao Shinkai, all of Saitama, and Daisaku Matsunaga, Tokyo, all of Japan, assignors to Pioneer Electronic Corporation and Nippon Kayaku Kabushiki Kaisha, both of Tokyo, Japan

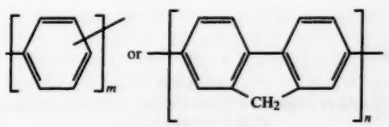
Filed Feb. 22, 1990, Ser. No. 483,379
Claims priority, application Japan, Feb. 23, 1989, 1-44941
Int. Cl.[5] H01J *1/62*
U.S. Cl. 428—457 **10 Claims**



1. An electroluminescent element comprising a cathode, a fluorescent substance layer of organic compound, a hole transport layer of organic compound and an anode which are laminated in sequence, wherein the fluorescent substance layer is made of a bisstyryl derivative capable of efficiently emitting light at a high luminance upon application of a low voltage and represented by the structural formula below,



where A denotes



m denotes a numeral of 1, 2, 3, or 4; n denotes a numeral of 1 or 2; and R_1, R_2, R_3, and R_4, independently denote a functional group selected from the group consisting of —H (hydrogen atom), C_ZH_{2Z+1} (alkyl group, with Z being an integer), OC_YH_{2Y+1} (alkoxyl group, with Y being an integer), —X (halogen group), $-NH_2$ (amino group), and NRR′ (dialkylamino group, with R and R′ being alkyl groups).

5,069,976

SNOW SKI SOLES

Michel Vuachet, Bron, and Jean-Marie Huet, St. Etienne du Vauvray, both of France, assignors to Atochem, Puteaux, France

Filed Feb. 9, 1989, Ser. No. 308,019
Claims priority, application France, Feb. 9, 1988, 88 01519
Int. Cl.[5] B32B *27/08*; A63C *5/00*
U.S. Cl. 428—474.4 **23 Claims**

1. A ski sole comprising a sheet or a film of a thermoplastic polymeric material in the form of a ski sole, said thermoplastic polymeric material comprising an intimate admixture of one or more polyolefins and one or more polyetheresteramides.

5,069,977

METHOD OF PRODUCING A MULTI-PLY SOLID WOOD STRUCTURE

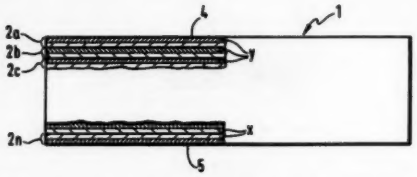
Siegmar Goenner, Oberkirch, Fed. Rep. of Germany, assignor to Firma Gebrüder Linck Maschinenfabrik "Gatterlinck" GmbH & Co. KG, Oberkirch, Fed. Rep. of Germany

Filed Nov. 1, 1990, Ser. No. 609,165

Claims priority, application Fed. Rep. of Germany, Nov. 1, 1990, 3936314

Int. Cl.[5] B32S *21/04;* B27G *11/00*

U.S. Cl. 428—537.1 8 Claims



1. A method of producing multi-ply solid wood structures comprising:

a) separating a squared timber into lamellae with a blade, said lamellae having a knife side that was in contact with the blade and having an opposite side that is opposite the knife side, and

b) arranging and securing the lamellae in a stacked array above and below a center plane extending parallel to the surfaces of the lamellae, to form a multi-ply solid wood structure such that, from said center plane of the wood structure, above or below said center plane, the knife side of each lamella is directed toward said center plane of the wood structure.

5,069,978

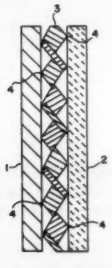
BRAZED COMPOSITE HAVING INTERLAYER OF EXPANDED METAL

Howard Mizuhara, Hillsborough, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Oct. 4, 1990, Ser. No. 594,494

Int. Cl.[5] B32B *3/24;* B23K *103/18*

U.S. Cl. 428—594 12 Claims



9. A brazed assembly consisting of two materials having different coefficients of thermal expansion with an expanded metal layer therebetween, the type of physical contact made by the expanded metal layer with each of said two materials being point contact, there being brazing fillets only at said point contacts.

5,069,979

PLATED COPPER ALLOY MATERIAL

Takashi Nakajima; Akira Yugi, and Shinichi Iwase, all of Sagamihara, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1991, Ser. No. 663,303

Claims priority, application Japan, Mar. 19, 1990, 2-69411; Mar. 19, 1990, 2-69412

Int. Cl.[5] B32B *15/20*

U.S. Cl. 428—644 4 Claims

1. Plated copper alloy material with an undercoat plating and an overcoat plating on the copper alloy, wherein said undercoat plating consists essentially of 0.03% to 5% by weight of zinc (Zn) and the remainder of copper (Cu) in the substantial part thereof, the total quantity of Zn and Cu being 98% or above and the total quantity of other elements being 2% or below.

5,069,980

VACUUM-BRAZING ALUMINUM CLADDING MATERIAL CONSISTING OF AL OR AL ALLOY CORE AND TWO SUPERPOSED ALUMINUM ALLOY CLADS WHICH COVER AT LEAST ONE SURFACE OF THE CORE

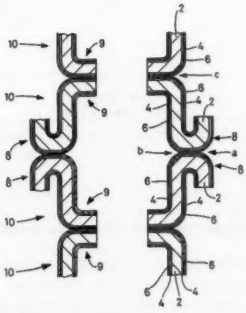
Keizo Namba; Yasunaga Itoh, both of Nagoya, and Hiroshi Nakanishi, Toyohashi, all of Japan, assignors to Sumitmo Light Metal Industries, Ltd., Tokyo, Japan

Filed Feb. 4, 1991, Ser. No. 649,951

Claims priority, application Japan, Feb. 8, 1990, 2-29326

Int. Cl.[5] F28F *21/08*

U.S. Cl. 428—654 14 Claims



1. A vacuum-brazing aluminum cladding material consisting of a core member of aluminum or aluminum alloy, and a first clad and a second clad formed on said first clad, which first and second clads cover at least one of opposite surfaces of said core member, said first clad consisting essentially of 6–14% by weight of Si, 0–0.6% by weight of Mg and the balance being at least Al, said second clad consisting essentially of 0–14% by weight of Si, 0.8–2.5% by weight of Mg and the balancing being at least Al, said second clad having a thickness of at least 5 μm, and said thickness and a content of Si of said second clad being determined so as to satisfy the following formula:

$$t \leqq |100/(10-c)|$$

wherein,

t=thickness (μm) of said second clad; and

c=content (% by weight) of Si of said second clad.

5,069,981

STEEL SHEET DIP-PLATED WITH A ZN-AL ALLOY AND PROCESS FOR THE MANUFACTURE THEREOF

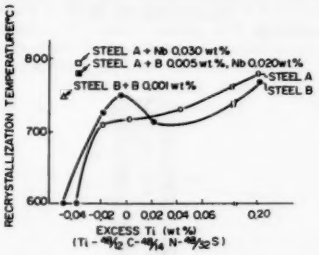
Hiroshi Oishi, and Akira Maruyama, both of Wakayama, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jul. 6, 1989, Ser. No. 376,007

Claims priority, application Japan, Jul. 7, 1988, 63-169550; May 2, 1989, 1-113158

Int. Cl.[5] B32B *15/00*

U.S. Cl. 428—659 7 Claims



1. A low carbon steel sheet dip-plated with a Zn-Al alloy, which comprises a steel substrate comprising C:0.07% by weight or less, and at least one of Ti:0.01–0.4% by weight, and B:0.001–0.010% by weight, and a dip plating comprising a Zn-Al alloy layer containing 3–8% by weight of Al, the steel sheet substrate being in a non-recrystallized and rolled state.

5,069,982

MIXED PHOSPHOR X-RAY INTENSIFYING SCREENS WITH IMPROVED RESOLUTION

William J. Zegarski, Towanda, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 19, 1990, Ser. No. 615,508

Int. Cl.[5] G03C *5/17;* G21K *4/00*

U.S. Cl. 428—690 12 Claims

1. An X-ray intensifying screen comprising a support, a layer of a phosphor mixture dispersed in a binder on said support, the improvement wherein said phosphor mixture consists essentially of a rare earth tantalate having the monoclinic M′ structure, said tantalate being $YNb_xTa_{1-x}O_4$, where x is 0 to about 0.15, to which is added 10% to 80% by weight based on the total weight of the phosphor mixture of a rare earth activated lanthanum oxyhalide.

5,069,983

MAGNETIC RECORDING MEMBER

Kyuzo Nakamura; Yoshifumi Ota; Michio Ishikawa; Noriaki Tani; Masanori Hashimoto, and Yuzo Murata, all of Yachimata, Japan, assignors to Nihon Shinku Gijutsu Kabushiki Kaisha, Chigasaki, Japan

Filed Sep. 29, 1989, Ser. No. 414,235

Claims priority, application Japan, Dec. 6, 1988, 63-307003; May 12, 1989, 1-117191; Jul. 25, 1989, 1-190648

Int. Cl.[5] G11B *23/00*

U.S. Cl. 428—694 1 Claim

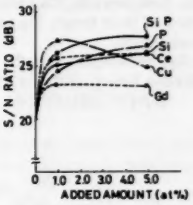
1. A magnetic recording member for longitudinal recording comprising:

(a) a non-magnetic hard disc substrate;

(b) a Cr base film formed on said substrate by a film forming process; and

(c) a Co alloy film formed on said Cr base film by the same film forming process as in (b),

wherein said Cr base film contains in addition to Cr at least one additional element selected from the group consisting of rare earth elements, Si, Cu, P and Ge, the amount of said additional element in said Cr base film being in the range from 0.2 atom % to 7.0 atom %, and wherein said Co alloy film is formed by continuous operation of said film forming process without interruption after completion of the formation of said Cr base film.



5,069,984

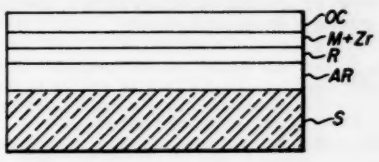
OVERWRITABLE MAGNETOOPTICAL RECORDING ELEMENT INCLUDING FIRST AND SECOND MAGNETIC LAYERS, WITH ONE OF WHICH CONTAINING ZIRCONIUM

Tukaram K. Hatwar; Anthony C. Palumbo, Jr., both of Rochester, and Douglas G. Stinson, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 23, 1990, Ser. No. 571,363

Int. Cl.[5] G11B *11/00*

U.S. Cl. 428—694 6 Claims



1. A direct-overwrite magneto-optic recording element comprising a substrate supporting first and second layers of terbium-iron-cobalt, one of said layers being doped with zirconium in an amount between about 5 and 15 atomic percent.

5,069,985

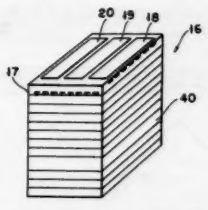
PLAQUE FUEL CELL STACK

Ronald Cohen, West Hartford, and Eugene W. Hall, Gastonbury, both of Conn., assignors to International Fuel Cells Corporation, South Windsor, Conn.

Filed Feb. 15, 1990, Ser. No. 480,243

Int. Cl.[5] H01M *8/02*

U.S. Cl. 429—26 8 Claims



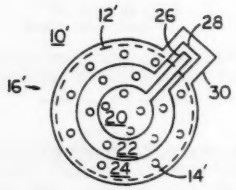
1. A fuel cell stack comprising a plurality of cell plaques, each plaque having a plurality of individual fuel cells electrically isolated from each other, the cells interconnected fluidly to provide a fuel and an oxidizer to each cell, adjacent cells disposed in a plaque-to-plaque relationship forming a substack, each substack serially connected electrically to another substack to increase the stack voltage.

5,069,986

SELECTIVE DISCHARGE LIMITING SEAL FOR A BATTERY

David R. Dworkin, Lawrenceville, Ga.; Robert D. Lloyd, and Tuan Nguyen, both of Boca Baton, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 426,914, Oct. 26, 1989, abandoned.
This application Feb. 4, 1991, Ser. No. 649,187
Int. Cl.[5] H01M *8/04*
U.S. Cl. 429—27 6 Claims



1. A battery comprising:

energy storage means for storing energy and for providing energy in response to exposure to at least one activating gas; and

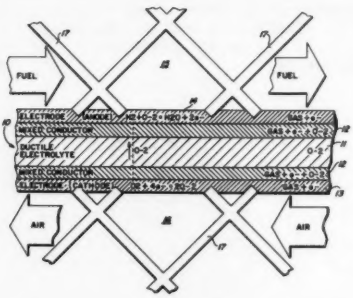
tape sealing means comprising at least two tape portions being removably adhesively affixed to a surface of the battery for incrementally controlling the amount of one or more activating gases provided to the energy storage means by removing one or more of the at least two tape portions of the tape sealing means.

5,069,987

SOLID OXIDE FUEL CELL ASSEMBLY

Arnold Z. Gordon, Beachwood, Ohio, assignor to IGR Enterprises, Inc., Cleveland, Ohio

Filed Jul. 6, 1990, Ser. No. 549,466
Int. Cl.[5] H01M *8/10*
U.S. Cl. 429—31 11 Claims



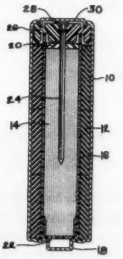
1. A solid oxide fuel cell comprising a solid state electrolytic cell wherein the solid electrolyte is a ductile composite comprising a regular, ordered, repeating array of ductile intersupported continuous fibers intimately mixed with a ceramic matrix, and means for connecting said cell to an electrical load, whereby when current is generated from said cell, fuel and air are converted to electric power.

5,069,988

METAL AND METAL OXIDE CATALYZED ELECTRODES FOR ELECTROCHEMICAL CELLS, AND METHODS OF MAKING SAME

Klaus Tomantschger, Mississauga; Karl Kordesch, Lakewood, and Robert D. Findlay, Mississauga, all of Canada, assignors to Battery Technologies Inc., Mississauga, Canada

Continuation-in-part of Ser. No. 405,185, Sep. 11, 1989, abandoned, which is a continuation of Ser. No. 234,933, Aug. 22, 1988, abandoned. This application Jun. 15, 1990, Ser. No. 540,932
Claims priority, application Canada, Aug. 24, 1987, 545225
Int. Cl.[5] H01M *10/52*
U.S. Cl. 429—59 13 Claims



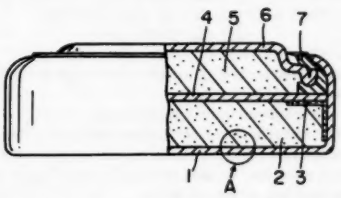
1. An alkaline electrochemical cell having a cathode, an anode, an alkaline electrolyte, and a porous electrode for use as an oxygen reduction electrode when said electrochemical cell operates at current densities up to 750 mA/sq.cm.; wherein said porous electrode comprises a porous conductive substrate and a porous catalytically active layer on said porous conductive substrate; wherein said porous conductive substrate is chosen from the group consisting of carbon, graphite, and metal; and wherein said porous catalytically active layer is chosen from the group consisting of a catalytically active non-noble metal, an oxide of a catalytically active non-noble metal, and carbon together with an oxide of a catalytically active non-noble metal.

5,069,989

ALKALINE CELL

Yoshio Uetani, Ibaraki; Tomotaka Ozeki, Takatsuki, and Kazuo Ishida, Suita, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Continuation of Ser. No. 787,017, Oct. 15, 1985, abandoned, which is a continuation of Ser. No. 561,348, Dec. 14, 1983, abandoned. This application Jun. 13, 1990, Ser. No. 537,118
Claims priority, application Japan, Dec. 15, 1982, 57-220695; Dec. 15, 1982, 57-220696; Dec. 15, 1982, 57-220697; Dec. 15, 1982, 57-220698; Dec. 15, 1982, 57-220699
Int. Cl.[5] H01M *2/04*
U.S. Cl. 429—164 9 Claims



1. An alkaline cell consisting essentially of positive active materials, negative active materials, an alkaline aqueous solution as an electrolyte, a negative electrode terminal plate for accommodating said negative active materials, and a positive

electrode can for accommodating said positive active materials, said cell having an open circuit voltage of about 1.57 volts, wherein said positive electrode can comprises stainless-steel including more than 23% by weight of chrome such that said positive electrode can is resistant to acidic corrosion from gastric juices.

5,069,990

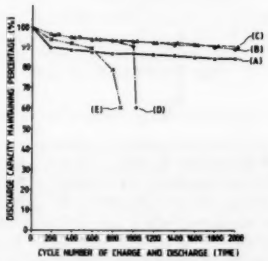
SEALED ALKALINE SECONDARY BATTERY

Koji Yoshimura, and Hideo Yasuda, both of Kyoto, Japan, assignors to Japan Storage Battery Co., Ltd., Kyoto, Japan

Filed Oct. 10, 1989, Ser. No. 419,250

Int. Cl.[5] H01M *2/18, 10/24*

U.S. Cl. 429—206 **19 Claims**



1. A sealed alkaline secondary battery comprising a cadmium negative electrode, a positive electrode, an electrolyte, and a gas-permeable micro-porous separator means, wherein said micro-porous separator means having one of circular and elliptic micro-pores for allowing gas migration between said positive electrode and said negative electrode, and for preventing internal short circuiting in a battery due to the migration of cadmium active material.

5,069,991

PANCHROMATIC ELECTROPHOTOGRAPHIC RECORDING ELEMENT CONTAINING MULTIPLE CARRIER-PRODUCING SENSENTIZERS

Reinhold J. Leyrer, Ludwigshafen; Peter Neumann, Mannheim, and Matthias Dust, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 17, 1989, Ser. No. 422,611

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1988, 3835520

Int. Cl.[5] G03G *5/04, 13/32*

U.S. Cl. 430—49 **20 Claims**

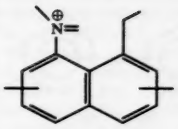
1. A panchromatic electrophotographic recording element comprising

A) an electrically conducting substrate and

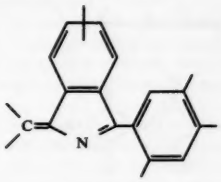
B) one or more photoconducting layers consisting essentially of

(b_1) one or more binders,

(b_2) several charge carrier-producing compounds or sensitizers, one or more of which are selected from the group consisting of Victoria Blue FB (C.I. 44045), crystal violet FN (C.I. 42555), rhodamine FB (C.I. 45170), strazone Orange R (C.I. 48040) and strazone range G (C.I. 48035), and one or more further compounds or sensitizers selected from the group consisting of the naphtholactam dyes which contain one or more chromophores of the general basic structure



and the isoindolenine dyes which contain one or more chromophores of the general basic structure



and

(b_3) one or more charge carrier-transporting compounds (photoconductors).

5,069,992

ELECTROPHOTOGRAPHIC PRINTING PLATE PRECURSOR CONTAINING ALKALI-SOLUBLE POLYURETHANE RESIN AS BINDER RESIN

Hiromichi Tachikawa; Hiroaki Yokoya; Syu Watarai, all of Kanagawa, and Toshiaki Aoai, Sizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

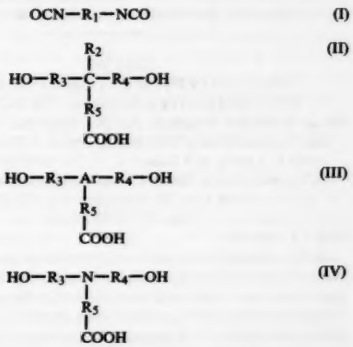
Filed Nov. 16, 1990, Ser. No. 614,421

Claims priority, application Japan, Nov. 17, 1989, 1-299157; Apr. 27, 1990, 2-110577; Apr. 27, 1990, 2-110578

Int. Cl.[5] G03G *13/28*

U.S. Cl. 430—49 **10 Claims**

1. An electrophotographic printing plate precursor comprising an electrically-conductive support having thereon a photoconductive layer containing at least a photoconductive compound and binding resin, wherein said binding resin is an alkali-soluble polyurethane resin having a basic skeleton comprising units of diisocyanate compound containing a diisocyanate group represented by formula (I), units of diol compound containing carboxyl group represented by formulae (II), (III) and (IV), and units derived from a compound obtained by ring-opening a tetracarboxylic dianhydride represented by formulae (V), (VI) and (VII) with a diol compound in a an amount of at least 1 mol%:



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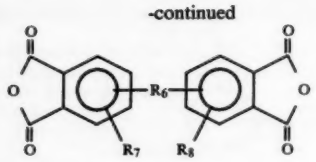
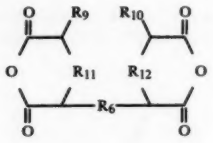
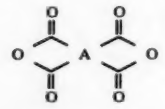


(V)



(VI)



(VII)

R_1 represents a divalent aliphatic or aromatic hydrogen having 2 or more carbon atoms which may contain substituents;

R_2 represents a hydrogen atom, C_{1-8} alkyl group, C_{6-15} aralkyl group, C_{6-15} aryl group, C_{1-8} alkoxy group, C_{6-15} aryloxy group, which may contain substituents, —$CONH_2$, —$COOR_6$, —OR_6, —$NHCONHR_6'$, —$NHCOOR_6'$, —$NHCOR_6'$, —$OCONHR_6'$ or —$CONHR_6$ (wherein R_6' represents C_{1-10} alkyl group or C_{7-15} aralkyl group);

R_3, R_4 and R_5 may be the same or different and each represents a divalent aliphatic or aromatic hydrocarbon group which may contain single bond and substituents, and two or three of R_2, R_3, R_4 and R_5 may combine and form a ring;

Ar represents a trivalent aromatic hydrocarbon group which may contain substituents;

R_6 represents a divalent aliphatic or aromatic hydrocarbon group having 2 or more carbon atoms which may contain substituent, —CO—, —SO—, —SO_2—, —O— or —S—;

R_7 and R_8 may be the same or different and each represents a hydrogen atom, an alkyl group, an aralkyl group, an aryl group, an alkoxy group, or a halogen atom, and two of R_6, R_7 and R_8 may combine and form a ring;

R_9 and R_{10} may be the same or different and each represents a hydrogen atom, an alkyl group, an aralkyl group, an aryl group or a halogen atom, and two of R_6, R_9 and R_{10} may combine and form a ring;

R_{11} and R_{12} may be the same or different and each represents an unsubstituted saturated single bond or double bond or a divalent aliphatic hydrocarbon group; and

A represents a mononuclear or polynuclear aromatic ring.

5,069,993

PHOTORECEPTOR LAYERS CONTAINING POLYDIMETHYLSILOXANE COPOLYMERS

Susan Robinette, Pittsford; Joseph Mammino, Penfield; Kathleen M. Carmichael, Williamson; Emery G. Tokoli, Rochester; Anita P. Lynch, and Robert C. U. Yu, both of Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 29, 1989, Ser. No. 459,337

Int. Cl.[5] G03G *5/04*

U.S. Cl. 430—58 **18 Claims**

1. An electrophotographic imaging member, comprising at least one exposed layer which contains a polydimethylsiloxane copolymer and a film forming resin binder, the polydimethylsiloxane copolymer being present in an amount to prevent undue phase separation, said layer being selected from the group consisting of a charge transport layer and an anti-curl layer.

5,069,994

USE OF COLORLESS, INTENSELY FLUORINATED AMMONIUM AND IMINIUM COMPOUNDS AS CHARGE CONTROL AGENTS FOR ELECTROPHOTOGRAPHIC RECORDING PROCESSES

Jörg Gitzel, Hattersheim am Main; Hans-Tobias Macholdt, Darmstadt; Alexander Sieber, Frankfurt am Main; Frank Wehowsky, Niedernhausen, and Günther Prossel, Burgkirchen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

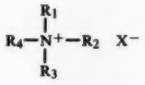
Filed Nov. 2, 1989, Ser. No. 430,732

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1988, 3837345

Int. Cl.[5] G03G *9/097*

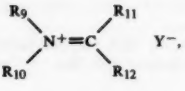
U.S. Cl. 430—110 **14 Claims**

1. A method for effecting in toners and developers a positive or negative charge control effect (for electrophotographic recording processes) comprising the step of incorporating the compounds of the formula (I)



(I)

in which R_1 to R_4 denote hydrogen atoms or organic radicals, at least one of the radicals R_1 to R_4 denoting a straight-chain or branched fluorine-containing alkyl radial or fluorine-containing alkenyl radical which contains 1 to 69 carbon atoms and 3 to 66 fluorine atoms and which may contain hydroxyl and/or chloromethyl and/or carboxylic acid amide and/or sulfonic acid amide and/or urethane and/or amino and/or R_5—O—R_6 and/or R_7—C(O)—O—R_8 groups in which R_5, R_6, R_7 and R_8 and (C_1–C_{30}) alkyl radicals and at most three of the radicals R_1 to R_4 are, independently of one another, hydrogen atoms, straight-chain or branched alyl radicals or alkenyl radicals containing 1 to 30 carbon atoms, aryl radicals or aralkyl radicals which may be substituted by (D_1–C_{30}) alkyl, (C_1–C_{30}) alkoxy or hydroxyl groups or halogen atoms, it being possible for two of the radicals R_1 to R_4 to join together to form a mono- or polynuclear ring system containing 4 to 12 carbon atoms which may be interrupted by 1 to 4 hetro atoms and may contain 0 to 6 double bonds and also be substituted by fluorine, chlorine, bromine or iodine atoms, (C_{1-C6}) alkyl, (C_1–C_6) alkoxy, nitro or amino groups, and X^- denotes an organic or inorganic anion, it being possible for the radicals R_1 to R_4 to be substituted by a COO^- or SO_3^- group and X^- ceasing in this case to be applicable, and of intensely fluorinated iminium compounds of the formula (II)



(II)

in which R_9 to R_{12} denote hydrogen atoms or organic radicals, at least one of the radicals R_9 to R_{12} denoting a straight-chain or branched fluorine-containing alkyl radical or fluorine-containing alkenyl radical which contains 1 to 69 carbon atoms and 3 to 66 fluorine atoms and which may contain hydroxyl and/or chloromethyl and/or carboxylic acid amide and/or sulfonic acid amide and/or urethane and/or amino and/or R_{5-O-R6} and/or $R_7C(O)$—O—R_8 groups, in which R_5,R_6, R_7 and R_8 have the abovementioned meanings, and at most three of the radicals R_9 to R^{12} denote, independently of one another, hydrogen atoms, straight-chain or branched alkyl radicals or alkenyl radicals containing 1 to 30 carbon atoms, it being possible for the aryl radials or aralkyl radicals to be substituted on the aromatic nucleus by (C_1–C_{30}) alkyl, (C_1–C_{30}) alkoxy, hydroxyl groups or halogen atoms, and for two of the radicals R_9 to R^{12} to join together to form a mono- or polynuclear ring system containing 4 to 17 carbon atoms

which may be interrupted by 1 to 4 heteroatoms and may contain 2 to 9 double bonds and also be substituted by fluorine, chlorine, bromine or iodine atoms, (C_1–C_6) alkyl, (C_1–C_6) akloxy, nitro or amino groups, and Y^- is an organic or inorganic anion, it being possible for the radicals R_9 to R_{12} to be substituted by a COO^- or SO_3^- group and Y^- in this case ceasing to be applicable, as colorless charge control agents having positive or negative charge control effect in toners and developers for electrophotographic recording processes.

5,069,995

STAIN ELIMINATION IN CONSECUTIVE COLOR TONING

Ronald Swidler, Palo Alto, Calif., assignor to CommTech International Management Corporation, Menlo Park, Calif.

Filed May 23, 1989, Ser. No. 356,264

Int. Cl.[5] G03G *9/00, 5/00*

U.S. Cl. 430—115 **19 Claims**

1. An electrophotographic liquid developer composition, comprising:

an insulating carrier liquid comprising a hydrocarbon medium, and, dispersed therein, toner comprising a resinous phase containing colorant, wherein the toner is in the form of individual particles in which is incorporated an antistatic agent that is substantially immiscible with the resinous phase and substantially insoluble in the insulating carrier liquid, or, if soluble in the insulating carrier liquid, is substantially free of acidic or basic moieties.

5,069,996

PROCESS FOR DEVELOPING SELECTED POSITIVE PHOTORESISTS

Robert F. Rogler, Rehoboth, Mass., assignor to OCG Microelectronic Materials, Inc., Cheshire, Conn.

Continuation-in-part of Ser. No. 383,468, Jul. 24, 1989, abandoned. This application Sep. 18, 1989, Ser. No. 408,849

Int. Cl.[5] G03C *1/74;* G03F *7/023, 7/32*

U.S. Cl. 430—168 **9 Claims**

1. The process of developing an image-wise exposed positive-working photoresist-coated substrate comprising the steps of:

(1) coating said substrate with a radiation-sensitive composition useful as a photoresist; said composition comprising an admixture of:

(a) at least one alkali-soluble binder resin;

(b) at least one photoactive compound; and

(c) a sufficient amount of at least one solvent to dissolve (a) and (b); subject to the proviso that said photoactive compound (b) is a mixture of fully and partially esterified o-naphthoquinone diazide esters of a polyhydroxyaromatic compound having at least four hydroxyl groups capable of being esterified by said diazide groups;

(2) subjecting said coating on said substrate to an image-wise exposure of radiation energy; and

(3) subjecting said image-wise exposed coated substrate to a developing solution to form an image-wise pattern in the coating, said developing solution comprising an aqueous solution of tetramethylammonium hydroxide which contains about 0.1% to about 1.0% by weight of a novolak-type resin.

5,069,997

POSITIVE AND NEGATIVE WORKING RADIATION SENSITIVE MIXTURES AND PRODUCTION OF RELIEF PATTERNS

Reinhold Schwalm, Wachenheim, and Horst Binder, Lampertheim, both of Fed. Rep. of Germany, assignors to Keil & Weinkauf, Ludwigshafen, Fed. Rep. of Germany

Filed May 16, 1989, Ser. No. 352,459

Claims priority, application Fed. Rep. of Germany, May 19, 1988, 3817012

Int. Cl.[5] G03C *7/039, 7/038*

U.S. Cl. 430—270 **7 Claims**

1. A radiation sensitive mixture containing

(a) a polymeric binder and

(b) an organic compound whose solubility in an aqueous alkaline developer is increased by the action of acid and which contains at least one acid cleavable group and additionally a group which forms a strong acid on irradiation,

wherein the polymeric binder (a) is a reaction product of a polymer that contains phenolic hydroxyl groups with dihydropyran or with an alkyl vinyl ether or is a polymer or polycondensate obtained by polymerization or polycondensation of reaction products of monomeric compounds that contain phenolic hydroxyl groups with dihydropyran or with an alkyl vinyl ether.

5,069,998

RADIATION SENSITIVE MIXTURE AND PRODUCTION OF RELIEF PATTERNS

Reinhold Schwalm, Wachenheim; Andreas Boettcher, Nussloch; Martin Fischer, Ludwigshafen, and Horst Binder, Lampertheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 16, 1989, Ser. No. 352,419

Claims priority, application Fed. Rep. of Germany, May 19, 1988, 3817010

The portion of the term of this patent subsequent to Nov. 28, 2006, has been disclaimed.

Int. Cl.[5] G03F *7/039*

U.S. Cl. 430—270 **8 Claims**

1. A radiation sensitive mixture containing

(a) a polymeric binder which is insoluble in water but soluble in aqueous alkaline solutions and (b) an organic compound whose solubility in an aqueous alkaline developer is increased by the action of acid and which contains at least one acid cleavable group and additionally at least one sulfonium group which forms a strong acid on irradiation,

wherein the polymeric binder (a) is poly(p-hydroxystyrene), poly(p-hydroxy-α-methylstyrene) or a copolymer of p-hydroxystyrene and p-hydroxy-α-methylstyrene and which additionally contains

(c) a nonphotosensitive organic compound which contains at least one acid cleavable bond and the solubility of which in an aqueous alkaline developer is increased by the action of acid, or

(d) a nonphotosensitive organic compound which contains at least one acid cleavable bond and which by the action of acid decomposes in such a way as to be completely removable by treatment at from 60° to 120° C., or a mixture of the nonphotosensitive organic compounds (c) and (d).

5,069,999

PS PLATE FOR MAKING LITHOGRAPHIC PRINTING PLATE REQUIRING NO DAMPENING WATER

Tatsuji Higashi; Mitsumasa Tsuchiya, and Nobuyuki Kita, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 26, 1990, Ser. No. 603,382
Claims priority, application Japan, Nov. 20, 1989, 301568
Int. Cl.[5] G03C 1/76
U.S. Cl. 430—272 20 Claims

1. A presensitized plate for use in making a lithographic printing plate requiring no dampening water which comprises a substrate provided thereon with in order:

(1) a photopolymerizable light-sensitive layer which comprises a monomer or an oligomer having at least one photopolymerizable olefinically unsaturated double bond, an organic solvent-soluble polyurethane resin or polyamide resin which is solid at room temperature and has film-forming ability and a photopolymerization initiator;

(2) a crosslinked silicone rubber layer; and

(3) a transparent cover coat layer, wherein the photopolymerization initiator comprises (a) a dialkylaminoaryl-carbonyl compound and (b) at least one member selected from the group consisting of xanthones, thioxanthones, acridones, benzophenones which do not carry a dialkylamino group, benzanthrones and anthraquinones and the transparent cover coat layer is formed from a biaxially oriented polypropylene film having a thickness ranging from 6 to 22 μm and an oxygen permeability ranging from 900 to 10,000 cc/m^2/24 hr./atm. at 20° C.

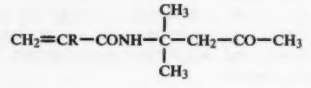
5,070,000

ELECTRODEPOSITION COATING COMPOSITION FOR USE IN PRINTED CIRCUIT BOARD PHOTO RESIST

Kenji Seko; Yuu Akaki; Naozumi Iwasawa, and Toshio Kondo, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Amagasaki, Japan

Filed Nov. 1, 1988, Ser. No. 265,770
Claims priority, application Japan, Nov. 5, 1987, 62-280224
Int. Cl.[5] G03F 7/12, 7/028
U.S. Cl. 430—280 7 Claims

1. An electrodeposition coating composition for use in printed circuit board photo resist, comprising (a) a water-soluble or water-dispersible photo-curable unsaturated resin prepared by a process which comprises copolymerizing diacetone (meth)acrylamide represented by the general formula:



where R represents H or CH_3, and α,β-ethylenically unsaturated acid as the essential components with (meth)acrylic esters to obtain an acrylic resin, followed by addition of a glycidyl group-containing unsaturated compound to the acrylic resin, and having an acid value of 20 to 300, a degree of unsaturation of 0.2 to 4.5 moles/kg, a number average molecular weight of 1,000 to 100,000 and a glass transition temperature of 0° C. to 100° C., and (b) a water-insoluble photopolymerization initiator.

5,070,001

LIGHT-SENSITIVE MIXTURE FOR PRODUCING POSITIVE OR NEGATIVE RELIEF COPIES

Paul Stahlhofen, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 23, 1987, Ser. No. 111,792
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1986, 3637717
Int. Cl.[5] G03C 1/70
U.S. Cl. 430—281 9 Claims

1. A light-sensitive mixture comprising:

(a) a compound having at least one acid-cleavable C—O—C bond, present in an amount of 4 to 50 percent by weight, based on total solids;

(b) a compound which forms a strong acid on exposure, present in an amount of about 0.5 to 20 percent by weight, based on total solids;

(c) a binder which is insoluble in water but soluble in aqueous alkaline solutions, present in an amount of about 30 to 90 percent by weight, based on total solids; and

a monomeric compound having at least one polymerizable or light-crosslinkable olefinic double bond adjacent to a CO group, present in an amount of about 2 to 30 percent by weight, based on total solids.

5,070,002

PHOTOIMAGEABLE PERMANENT RESIST

Edward J. Leech, Oyster Bay, N.Y., and Steven M. Johnson, Arnold, Md., assignors to Amp-Akzo Corporation, Newark, Del. and Haven Corporation, Baltimore, Md.

Continuation-in-part of Ser. No. 242,782, Sep. 13, 1988, abandoned. This application Aug. 11, 1989, Ser. No. 391,203
Int. Cl.[5] G03F 7/028
U.S. Cl. 430—325 12 Claims

1. A process for applying a permanent, photodefined coating on a substrate, the process comprising:

a. providing a photodefinable polymeric composition composed of

a free radical photoinitiator,

a monomer capable of being polymerized by action of the photoinitiator, said monomer having a viscosity greater than about 1 kPa-s or being a solid at room temperature,

a resinous compound, selected from solid, resinous compounds having epoxide and acidic functional groups, the epoxide functionality of the resinous compound being greater than 2, and the acid number being greater than about 15 and less than 60,

the photodefinable polymeric solution being dispersed in a solvent to form a fluid coating composition;

b. coating the substrate with the fluid coating composition;

c. drying the fluid coating composition providing a dried, photodefinable coating on the substrate;

d. exposing at least part of the photodefineable coating to ultraviolet light while protecting the rest from the ultraviolet light, the energy of the ultraviolet light being sufficient to activate the photoinitiator and polymerize the monomer in the coating and render the exposed portion of the coating insoluble;

e. subsequently contacting the coating with an aqueous, alkaline, developing solution, in an amount and for a time sufficient to dissolve away the portions of the photodefinable coating which had been protected from the ultraviolet light, leaving a photodefined coating on the substrate;

f. thermally crosslinking the resinous compound by reacting the epoxide functional groups, forming the permanent, photodefined coating.

5,070,003

METHOD FOR PROCESSING SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Hideaki Naruse, and Kazuaki Yoshida, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 3, 1989, Ser. No. 416,802

Claims priority, application Japan, Oct. 3, 1988, 63-249234

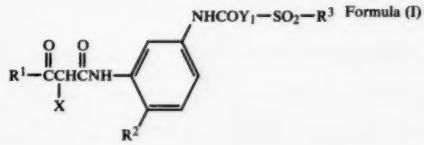
The portion of the term of this patent subsequent to Apr. 2, 2008, has been disclaimed.

Int. Cl.[5] G03C *7/32*

U.S. Cl. 430—389 **16 Claims**

1. In a method for processing an image-wise exposed silver halide color photographic material with a color developer that contains at least one aromatic primary amine color-developing agent, the improvement comprising:

processing said image-wise exposed silver halide color photographic material including a layer containing a silver halide emulsion comprising 80 mol % or over of silver chloride and at least one yellow coupler represented by the following formula (I)



Formula (I)

wherein R^1 represents a tertiary alkyl group or an aryl group, R^2 represents a halogen atom or an alkoxy group, R^3 represents an alkyl group or an aryl group, Y_1 represents a divalent linking group, and X represents a coupling split-off group,

said photographic material having a total coated silver of 0.75 g/m^2 or below,

with said color developer containing chloride ions in an amount of 3.5×10^{-2} to 1.5×10^{-1} mol/l, and bromide ions in an amount of 3.0×10^{-5} to 1.0×10^{-3} mol/l.

5,070,004

BLEACHING STARTER AND PROCESSING OF COLOR PHOTOGRAPHIC SILVER HALIDE PHOTOSENSITIVE MATERIAL USING THE SAME

Yoshihiro Fujita, Minami-ashigara, and Shigeru Nakamura, Hatano, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 560,944, Jul. 31, 1990. This application Dec. 20, 1990, Ser. No. 630,639

Claims priority, application Japan, Jul. 31, 1989, 1-198764; Nov. 17, 1989, 1-298836

Int. Cl.[5] G03C *7/42*

U.S. Cl. 430—393 **13 Claims**

1. In a method for processing a color photographic silver halide photosensitive material after imagewise exposure, comprising the steps of: color development and processing with a solution having a bleaching function,

the improvement wherein said solution having a bleaching function is prepared by adding a starter to a solution containing a bleaching agent, said starter comprising at least one member selected from compounds of general Formula (II) in water in an amount of from 3 to 10 mol/-liter:

(II)

wherein

R_5 is a hydrosyalkyl radical having up to 6 carbon atoms, and

R_6 is selected from the group consisting of a hydrogen atom, an alkyl radical having up to 6 carbon atoms, and a hydroxyalkyl radical having up to 6 carbon atoms.

5,070,005

PROCESS FOR PRODUCING SILVER HALIDE PHOTOGRAPHIC MATERIALS

Takeo Arai; Mariko Kato, and Toshiharu Nagashima, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Mar. 28, 1991, Ser. No. 676,748

Claims priority, application Japan, Apr. 5, 1990, 2-91228

Int. Cl.[5] G03C *1/76*

U.S. Cl. 430—523 **9 Claims**

1. A process for producing a silver halide photographic material containing a support which has a first side and a second side, a light-sensitive silver halide emulsion layer on said first side, a first hydrophilic colloidal layer on said emulsion layer and a second hydrophilic colloidal layer on said second side, comprising:

providing said first hydrophilic colloidal layer on said emulsion layer,

providing said second hydrophilic colloidal layer on said second side, and

drying said first hydrophilic colloidal layer and said second hydrophilic colloidal layer simultaneously,

wherein said first hydrophilic colloidal layer and said second hydrophilic colloidal layer have a matting agent with a particle size of not less than 4 μm in an amount of not less than 4 mg/m^2,

wherein said first hydrophilic colloidal layer and said second hydrophilic colloidal layer have a smooster value of not less than 25 mmHg.

5,070,006

PHOTOGRAPHIC MATERIAL COMPRISING AN NC LAYER

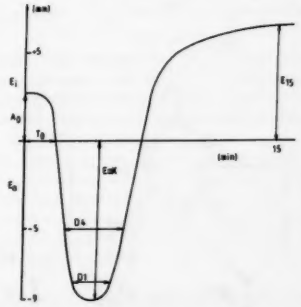
Werner Krafft, Leverkusen; Günter Helling, Odenthal, and Günter Matschke, Leichlingen, all of Fed. Rep. of Germany, assignors to Agfa Gevaert AG, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Apr. 26, 1991, Ser. No. 692,280

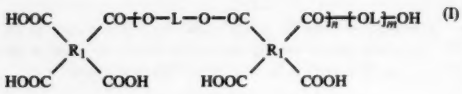
Claims priority, application Fed. Rep. of Germany, May 11, 1990, 4015161

Int. Cl.[5] B03C *1/76*

U.S. Cl. 430—531 **3 Claims**



1. A photographic recording material comprising a support, at least one photosensitive, gelatine-containing silver halide emulsion layer on one side of the support and a gelatine-containing NC layer on the other side of the support, wherein the NC layer contains at least one hydrophilic polymer of which at least 60% by weight corresponds to the following formula



(I)

in which

R_1 represents alkylene, arylene, aralkylene or cycloalkylene,

L is the residue of a polyester diol having an average molecular weight of 500 to 20,000,

m=0 or 1,

n=0 to 30 and preferably 0 to 10 and

m+n≧1,

in a quantity of 0.9 to 4 g/m^2, the ratio by weight of gelatine on the emulsion side to gelatine in the NC layer being 2 to 3:1 and the ratio by weight of gelatine in the NC layer to the hydrophilic polymer being 2 to 5:1.

5,070,007

COLOR PHOTOGRAPHIC MATERIALS COMPRISING PHENOLIC THIANE DERIVATIVES AS LIGHT AND THERMAL OXIDATION STABILIZERS

Jean Rody, Riehen, and David G. Leppard, Marly, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

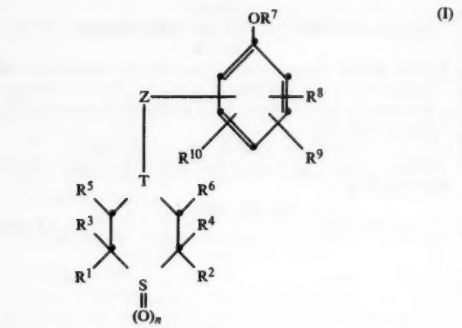
Division of Ser. No. 251,082, Sep. 29, 1988, Pat. No. 5,006,665. This application Feb. 6, 1991, Ser. No. 651,612

Claims priority, application Switzerland, Sep. 30, 1987, 3800/87

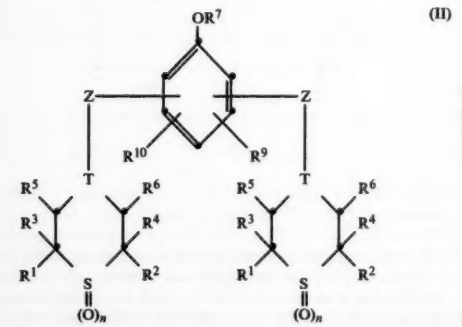
Int. Cl.^{5} G03C *1/84, 7/26;* C07D *335/02*

U.S. Cl. 430—551 **10 Claims**

1. A method for the stabilization of colour photography recording materials containing at least one gelatin layer containing at least one silver halide and one dye coupler against light and thermal oxidation which comprises incorporating into at least one gelatin layer an effective stabilizing amount of at least one compound of the formula I or II

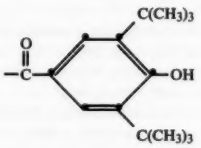


(I)

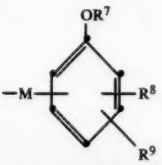


(II)

in which n is 0, 1 or 2, R^1 and R^2 independently of one another are hydrogen or methyl, R^3 and R^4 independently of one another are hydrogen, C_1–C_4alkyl, phenyl, thienyl or phenyl which is substituted by 1 or 2 C_1–C_8alkyl groups, cyclohexyl, phenyl, C_7–C_9phenylalkyl, hydroxyl, C_1–C_{18}alkoxy or halogen, R^5 and R^6 independently of one another are hydrogen, C_1–C_4alkyl, phenyl, —COO(C_1–C_{18}alkyl), —CO—CH_3 or —CO—phenyl, R^7 is hydrogen, C_1–C_8alkyl or one of the groups —CO—R^{11}, —CO—COO(C_1–C_4-alkyl), —SO_2—R^{12}, —CON(R^{13})(R^{14}), —Si(R^{15})(R^{16})(R^{17}) or

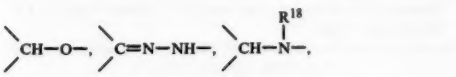


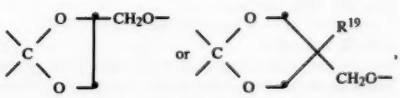
R^8 and R^9 independently of one another are hydrogen, C_1–C_{12}alkyl, C_7–C_9phenylalkyl, C_5–C_8cycloalkyl or phenyl, R^{10} is hydrogen, —OR^7 or a group of the formula III



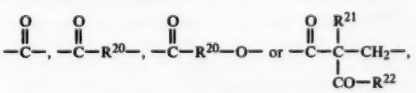
III

in which M is a direct bond, —O—, —S—, —S—S—, —CH_2—, —CH(C_1–C_8alkyl)— or —$C(CH_3)_2$—, R^{11} is C_1–C_{20}alkyl, C_3–C_{20}alkenyl, C_5–C_{12}cycloalkyl, C_7—C_{13}phenylalkyl or C_6–C_{10}aryl, R^{12} is C_1–C_{12}alkyl, C_6–C_{10}aryl or C_7–C_{24}alkylaryl, R^{13} is hydrogen, C_1–C_{12}alkyl or cyclohexyl, R^{14} is C_1–C_{12}alkyl, C_6–C_{10}aryl, C_1–C_{12}alkylsubstituted C_6–C_{10}aryl or cyclohexyl, or R^{13} and R^{14}, together with the N atom, form a 5- or 6-membered saturated heterocyclic ring, R^{15}, R^{16} and R^{17} independently of one another are C_1–C_{12}alkyl, C_3–C_{12}alkenyl, phenyl, cyclohexyl or benzyl, T is a trivalent group which completes the ring to give a thiane ring and is one of the following groups:

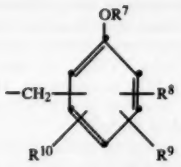




in which R^{18} is hydrogen, C_1–C_{12}alkyl, benzyl, cyclohexyl or phenyl and R^{19} is hydrogen or C_1–C_4alkyl, Z is a divalent bonding member between T and the phenol radical and is one of the following groups:

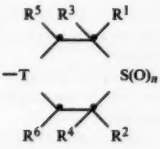


the carbonyl group of which is bonded to T and in which R^{20} is C_1–C_{14}alkylene, R^{21} is hydrogen, C_1–C_{12}alkyl, phenyl, C_7–C_9phenylalkyl or a group of the formula IV



IV

and R^{22} is a group —O(C_1–C_4alkyl) or a group of the formula V



V

5,070,008

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Hideaki Maekawa, and Masanobu Miyoshi, both of Odawara, Japan, assignors to Konica Corporation, Tokyo, Japan

Continuation of Ser. No. 300,478, Jan. 23, 1989, abandoned. This application Nov. 14, 1990, Ser. No. 614,019

Claims priority, application Japan, Jan. 30, 1988, 63-20365

Int. Cl.[5] G03C *1/02*

U.S. Cl. 430—567 9 Claims

1. A light-sensitive silver halide photographic material comprising a support having thereon a silver halide emulsion layer containing silver halide grains with a silver chloride content of not less than 90 mole percent, wherein

(a) formation of said silver halide grains occurs under a pH of not more than 5,

(b) an iridium compound is added before physical ripening is begun, and

(c) a nitrogen-containing heterocyclic compound represented by Formula S is added at, or before, the completion of an addition of either solution used for the formation of said silver halide grains, with the proviso that a solubility product of said compound with a silver ion is not more than 10^{-12},

formula S

wherein Q represents a group of atoms necessary to for a 5-member or 6-member heterocyclic group, or a 5-member or 6-member heterocyclic group fused with a benzene ring; and M represents a hydrogen atom or a cation.

5,070,009

PROCESS AND REAGENTS FOR THE DETECTION OF A MONOCATERNARY NUCLEIC ACID, PARTICULARLY A RNA IN A BIOLOGICAL MATERIAL AND PARTICULARLY IN LEUCOCYTE PREPARATIONS

Michel Crepin, Paris, France, assignor to Institut Pasteur, Paris, France

Continuation of Ser. No. 657,236, Oct. 3, 1984, abandoned. This application Sep. 15, 1988, Ser. No. 246,004

Claims priority, application France, Oct. 3, 1983, 83 15726

Int. Cl.[5] C12Q *1/68*

U.S. Cl. 435—6 16 Claims

1. An in vitro diagnostic test for the detection of a genetic abnormality in cells in a liquid biological sample, the genetic abnormality being evidenced by the absence or presence of a single-stranded nucleotide sequence in said cells; said test consisting essentially of the steps of:

a) treating with a reagent consisting essentially of an ionic salt, complexes of RNAs and proteins from said cells; said ionic salt being present in an amount effective to dissociate said RNAs from said proteins, without simultaneously causing substantial denaturation of double-stranded DNAs present from said cells, and thereby to provide, in the presence of said double-stranded DNAs, unmasked RNAs that are hybridizable with nucleic acids containing complementary nucleotide sequences;

b) then depositing said unmasked RNAs on a filter suitable for in situ hybridization;

c) then washing said unmasked RNAs on said filter with an ionic detergent to remove proteins;

d) then treating said filter to remove background noise from said filter;

e) then contacting said unmasked RNAs on said filter with a DNA probe containing a nucleotide sequence complementary to said single-stranded nucleotide sequence evidencing said genetic abnormality under conditions allowing for the hybridization of said unmasked RNAs with said nucleotide sequence of said probe; and

f) then determining, from the presence or absence of hybridization of the nucleotide sequence of said probe with said unmasked RNAs on said filter, the presence or absence in said cells of the single-stranded nucleotide sequence evidencing said genetic abnormality.

5,070,010

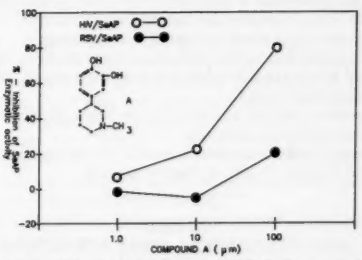
METHOD FOR DETERMINING ANTI-VIRAL TRANSACTIVATING ACTIVITY

Ming Chu Hsu, New York, N.Y., assignor to Hoffman-La Roche Inc., Nutley, N.J.

Filed Oct. 30, 1989, Ser. No. 428,555

Int. Cl.[5] C12Q *1/68*

U.S. Cl. 435—6 15 Claims



1. A method for determining the anti-viral transactivating activity of a substance, said method comprising the steps of:

a) contacting the test substance with a cultured first mammalian cell capable of expressing secreted Alkaline Phosphatase ("SeAP"), said cell comprising;

a gene capable of causing the expression of SeAP by said cell, a viral transactivator-activated promoter for activating said gene which causes SeAP expression by said cell and a transactivator gene which is capable of causing the expression of a viral transactivator which activates said promoter,

to determine if said substance inhibits the production of SeAP by said cell;

b) contacting said substance with another cultured mammalian cell capable of expressing SeAP, said cell comprising a gene capable of causing the expression of SeAP by said cell and a self-activating viral promoter which activates said SeAP expression,

to determine if said substance inhibits the production of SeAP by said second cell; and

c) determining if the addition of the substance selectively inhibits the amount of SeAP produced by said first mammalian cell whereby such selective inhibition of SeAP expression by said first cell correlates to selective inhibition of viral transactivator expression and thereby demonstrates the anti-viral transactivating specific activity of the substance.

5,070,011

DNA PROBES FOR THE DETECTION OF *HAEMOPHILUS DUCREYI* AND METHOD OF USE

Linda M. Parsons, Voorheesville; Lawrence Bopp, Scotia; Alfred L. Waring, Saratoga Springs, and Mehdi Shayegani, Delmar, all of N.Y., assignors to Health Research Inc., Albany, N.Y.

Filed Jun. 16, 1989, Ser. No. 367,024

Int. Cl.[5] C12Q *1/68*; G01N *33/566*; C07H *15/12, 17/00*

U.S. Cl. 435—6 **16 Claims**

1. A nucleic acid probe consisting essentially of a nucleic acid sequence corresponding to ATCC No. 68008, or ATCC No. 68009, or ATCC No. 68010 which specifically hybridizes to *Haemophilus ducreyi* DNA.

5,070,012

MONITORING OF CELLS AND TRANS-ACTIVATING TRANSCRIPTION ELEMENTS

Garry P. Nolan, Granby, Conn.; Steven Fiering, Palo Alto, and Leonard A. Herzenberg, Stanford, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Mar. 30, 1988, Ser. No. 175,416

Int. Cl.[5] C12Q *1/68*

U.S. Cl. 435—6 **13 Claims**

1. A method for studying a regulatory element of a transcriptional initiation regulatory system in a viable mammalian cell, said cell comprising a non-wild type expression construct comprising a transcriptional initiation regulatory region comprising a regulatory sequence of interest and a structural gene encoding β-galactosidase, wherein said β-galactosidase employs as a substrate a β-galactosidyl ether of a fluorescent phenolic compound that produces a fluorescent product upon hydrolysis of said ether, said method comprising:

substantially irreversibly introducing said substrate into said cell in a hypotonic solution at a temperature in the range of about 25°–40° C.;

incubating said cell at a temperature below about the membrane freezing point; and

detecting said fluorescent product in said cell as a measure of the activity of said regulatory element.

5,070,013

IMMUNOCHEMICAL ASSAY FOR HUMAN GRANULOCYTE-MACROPHAGE COLONY STIMULATING FACTOR

John S. Abrams, Belmont, and Robert E. Van Dyke, Daly City, both of Calif., assignors to Schering Corporation, Madison, N.J.

Filed May 31, 1988, Ser. No. 201,068

Int. Cl.[5] G01N *33/53, 33/543*; C07K *15/14*; C12N *15/00*

U.S. Cl. 435—7.5 **8 Claims**

1. A method of detecting the presence of human granulocyte-macrophage colony stimulating factor (GM-CSF) in a sample suspected of containing human GM-CSF, the method comprising the steps of:

providing a first monoclonal antibody specific for a first antigenic determinant on human GM-CSF, the first monoclonal antibody being produced by a hybridoma selected from the group consisting of BVD2-5A2.4 (ATCC accession no. HB9567), BVD2-23B6.4 (ATCC accession no. HB9568), BVD2-21C11.3 (ATCC accession no. HB9569), and derivative or parental hybridomas thereof;

providing a second monoclonal antibody specific for a second antigenic determinant on human GM-CSF, the second antigenic determinant being different from the first antigenic determinant and the second monoclonal being produced by a hybridoma selected from the group consisting of BVD2-5A2.4 (ATCC accession no. HB9567), BVD2-23B6.4 (ATCC accession no. HB9568), BVD2-21C11.3 (ATCC accession no. HB9569), and derivative or parental hybridomas thereof;

providing a signal generating means capable of being operationally associated with either the first monoclonal antibody or the second monoclonal antibody to produce a signal whose intensity is related to the amount of either the first monoclonal antibody or the second monoclonal antibody, respectively;

attaching either the first monoclonal antibody or the second monoclonal antibody to a support means to form an antibody-support conjugate;

contacting the sample with the antibody-support conjugate so that human GM-CSF in the sample binds to the antibody-support conjugate;

contacting the first monoclonal antibody operationally associated with the signal generating means with the human GM-CSF bound to the antibody-support conjugate, provided that the antibody-support conjugate includes the second antibody or;

contacting the second antibody operationally associated with the signal generating means with the human GM-CSF bound to the antibody-support conjugate, provided that the antibody-support conjugate includes the first monoclonal antibody;

measuring the signal generated by the signal generating means; and

associating said signal with the presence and/or amount of human GM-CSF in the sample.

5,070,014

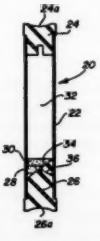
STABILIZATION OF SPECIMENS FOR MICROBIAL ANALYSIS

Gordon L. Dorn, Dallas, Tex., assignor to Wadley Technologies, Inc., Dallas, Tex.

Continuation of Ser. No. 772,954, Sep. 4, 1985, abandoned, which is a continuation-in-part of Ser. No. 525,164, Aug. 23, 1983, abandoned, which is a continuation-in-part of Ser. No. 431,776, Sep. 30, 1982, abandoned. This application Jun. 30, 1989, Ser. No. 374,310

Int. Cl.[5] C12Q *1/00*; C12M *1/28, 1/30*;

U.S. Cl. 435—34 **48 Claims**



40. An article for the collection and treatment of a specimen, comprising:

(a) a receptacle for receiving a volume of specimen; and

(b) a water-soluble specimen transport system deposited in said receptacle, said specimen transport system comprising a water-soluble additive at a concentration effective to prevent replication of microorganisms present in said specimen, when said specimen is mixed with said water additive therein to form a solution, and reducing the cidal activity toward said microorganisms of antimicrobial factors present in said specimen so that at least some

microorganisms will be capable of replication upon dilution of said solution on medium capable of supporting replication of said microorganisms.

5,070,015

NOVEL AVERMECTINS ARE PRODUCED FROM KNOWN MICROORGANISMS

Brian R. Petuch, Florence; Shieh-Shung T. Chen, Morganville; Edward S. Inamine, Rahway, and Raymond F. White, Englishtown, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Oct. 15, 1990, Ser. No. 597,604

Int. Cl.[5] C12P *17/18, 39/00, 19/60;* **C12R** *1/045*

U.S. Cl. 435—42 **7 Claims**

1. A fermentation medium containing *B. subtilis* and *S. griseus* and a fermentation substrate that is 13-deoxy ivermectin aglycone.

5,070,016

INTEGRATED PROCESS FOR PRODUCING ETHANOL, METHANOL AND BUTYL ETHERS

David E. Hallberg, Norcross, Ga., assignor to Revolution Fuels of America, Inc., Atlanta, Ga.

Filed Mar. 28, 1991, Ser. No. 676,821

Int. Cl.[5] C12P *7/00, 7/14, 7/06, 7/02*

U.S. Cl. 435—132 **16 Claims**

1. An integrated continuous process for the production of ethanol and methanol comprising:

(a) fermenting a vegetable material anaerobically in an aqueous medium to produce ethanol in said medium and by-product carbon dioxide containing less than 1% by volume air;

(b) recovering said ethanol from said aqueous medium;

(c) reacting said by-product carbon dioxide containing less than 1% by volume air with hydrogen in a methanol reactor to form a gas stream containing methanol.

5,070,017

METHOD FOR BIODEGRADING BISPHENOL ALKANES

John H. Lobos, Rexford; Terry K. Leib, and Tah-Mun Su, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 11, 1990, Ser. No. 625,381

Int. Cl.[5] C12R *1/01;* **C12P** *1/04, 7/22*

U.S. Cl. 435—170 **3 Claims**

1. A method for biodegrading bisphenol alkanes which comprises treating the bisphenol alkane under aerobic conditions and at a pH in the range of 6 to 7 with an effective amount of a biologically pure culture of a gram negative, motile, rod-shaped bacterium NRRL-B-18737.

5,070,018

METHOD OF CONTROLLING GENE EXPRESSION

Norman K. Peters, Berkeley; John W. Frost, Menlo Park, and Sharon R. Long, Palo Alto, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University Stanford, Calif.

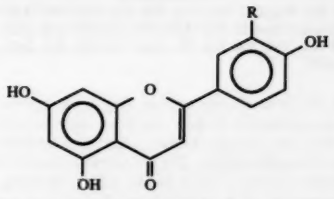
Filed Nov. 7, 1986, Ser. No. 928,796

Int. Cl.[5] C12N *15/00, 1/20;* **C12P** *21/00*

U.S. Cl. 435—172.3 **12 Claims**

1. A method of inducing expression of a DNA segment under the control of an *R. Meliloti* nod ABC gene promoter, which comprises:

administering to a host containing said nod gene promoter an amount sufficient to activate expression of said DNA segment of a compound of the formula:



wherein R is H or OH, wherein said administering occurs in the presence of an *R. Meliloti* nod D gene product.

5,070,019

IMMOBILIZATION OF YEAST IN ALGINATE BEADS FOR PRODUCTION OF ALCOHOLIC BEVERAGES

Frank Hill, Mettmann-Oberschwarzbach, Fed. Rep. of Germany, assignor to Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Mar. 7, 1990, Ser. No. 489,535

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1989, 3908997

Int. Cl.[5] C12N *11/10, 11/04;* **C12C** *11/00;* **C12G** *1/00*

U.S. Cl. 435—178 **16 Claims**

9. An immobilized yeast useful in the preparation of alcoholic beverages, prepared by a process comprising the steps of:

(i) adding a sodium alginate solution containing yeast cells dropwise to a $CaCl_2$ solution to obtain beads;

(ii) hardening said beads in said $CaCl_2$ solution, for 30 to 180 minutes, to obtain hardened beads;

(iii) washing said hardened beads for 100 to 500 minutes at 5° to 35° C. with water having a salt content of up to 0.5 g/l, to obtain washed beads; and

(iv) drying said washed beads at a bead temperature of 10° to 50° C.

5,070,020

RECOMBINANT DNA EXPRESSION VECTORS AND DNA COMPOUNDS THAT ENCODE DEACETOXYCEPHALOSPORIN C SYNTHETASE

Thomas D. Ingolia; Steven Kovacevic; James R. Miller, all of Indianapolis, and Paul L. Skatrud, Greenwood, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 9, 1988, Ser. No. 192,273

Int. Cl.[5] C12N *15/63, 15/52, 15/80, 15/76*

U.S. Cl. 435—183 **50 Claims**

1. A recombinant DNA molecule that encodes the DAOCS activity of *Streptomyces clavuligerus.*

2. The recombinant DNA molecule of claim 1 that encodes a protein of structure:

H_2N—Met Asp Thr Thr Val Pro Thr Phe Ser Leu Ala Glu Leu Gln Gln Gly Leu His Gln Asp Glu Phe Arg Arg Cys Leu Arg Asp Lys Gly Leu Phe Tyr Leu Thr Asp Cys Gly Leu Thr Asp Thr Glu Leu Lys Ser Ala Lys Asp Ile Val Ile Asp Phe Phe Glu His Gly Ser Glu Ala Glu Lys Arg Ala Val Thr Ser Pro Val Pro Thr Met Arg Arg Gly Phe Thr Gly Leu Glu Ser Glu Ser Thr Ala Gln Ile Thr Asn Thr Gly Ser Tyr Ser Asp Tyr Ser Met Cys Tyr Ser Met Gly Thr Ala Asp Asn Leu Phe Pro Ser Gly Asp Phe Glu Arg Ile Trp Thr Gln Tyr Phe Asp Arg Gln Tyr Thr Ala Ser Arg Ala Val Ala Arg Glu Val Leu Arg Ala Thr Gly Thr Glu Pro Asp Gly Gly Val Glu Ala Phe Leu Asp Cys Glu Pro Leu Leu Arg Phe Arg Tyr Phe Pro Gln Val Pro Glu His Arg Ser Ala Glu Glu Gln Pro Leu Arg Met Ala Pro His Tyr Asp Leu Ser Met Val Thr Leu Ile Gln Gln Thr Pro Cys Ala Asn Gly Phe Val Ser Leu Gln Ala Glu Val Gly Gly Ala Phe Thr Asp Leu Pro Tyr Arg Pro Asp Ala Val Leu Val Phe Cys Gly Ala Ile Ala Thr Leu Val Thr Gly Gly Gln Val Lys Ala Pro Arg His His Val Ala Ala Pro Arg Arg Asp Gln Ile Ala Gly Ser Ser Arg Thr Ser Ser Val Phe Phe Leu Arg Pro Asn Ala Asp Phe Thr

-continued

Phe Ser Val Pro Leu Ala Arg Glu Cys Gly Phe Asp Val
Ser Leu Asp Gly Glu Thr Ala Thr Phe Gln Asp Trp Ile
Gly Gly Asn Tyr Val Asn Ile Arg Arg Thr Ser Lys
Ala—COOH

wherein Ala is an alanine residue, Arg is an arginine residue, Asn is an asparagine residue, Asp is an aspartic acid residue, —COOH is the carboxy terminus, Cys is a cysteine residue, Gln is a glutamine residue, Glu is a glutamic acid residue, Gly is a glycine residue, —H_2N is the amino terminus, His is a histidine residue, Ile is an isoleucine residue, Leu is a leucine residue, Lys is a lysine residue, Met is a methionine residue, Phe is a phenylalanine residue, Pro is a proline residue, Ser is a serine residue, Thr is a threonine residue, Trp is a tryptophan residue, Tyr is a tyrosine residue, and Val is a valine residue.

29. A method for expressing DAOCS activity in a recombinant host cell, said method comprising:

(1) transforming said host cell with a recombinant DNA expression vector that comprises:

(a) a promoter that functions in said host cell; and

(b) a DNA molecule of claim 2 operably linked to said promoter; and

(2) culturing said host cell transformed in step (1) under conditions suitable for gene expression.

5,070,021

METHOD OF MODIFYING OLIGOSACCHARIDE STRUCTURE OF TISSUE PLASMINOGEN ACTIVATOR

Joseph K. Welply, St. Peters, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 10, 1989, Ser. No. 295,621

Int. Cl.[5] C12N *9/48, 15/58, 9/64*

U.S. Cl. 435—226 **2 Claims**

1. The method of modifying the oligosaccharide structure of human t-PA which comprises substituting Arg for Cys at any of amino acid residues 51, 56, 62, 73, 75 or 84 in said t-PA to thereby modify the oligosaccharide structure at Asn-117 from a high mannose type to a complex type oligosaccharide structure and expressing said t-PA in C-127 cells.

5,070,022

ENZYMIC PROCESS FOR PREPARING LEUKOTRIENE ANTAGONISTS

David L. Hughes, Old Bridge; Paul J. Reider, Westfield, both of N.J.; Joseph S. Amato, Brooklyn, N.Y.; James J. Bergan, Piscataway, and Edward J. J. Grabowski, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

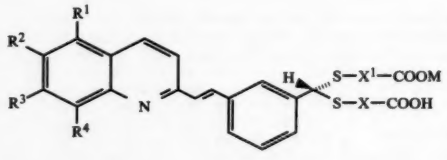
Filed Dec. 22, 1988, Ser. No. 288,216

Int. Cl.[5] C12P *41/00*

U.S. Cl. 435—280 **10 Claims**

1. A process for preparing a compound of the formula:

I



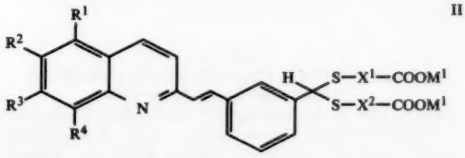
wherein

R^1, R^2, R^3 and R^4 are independently selected from the group consisting of hydrogen, chlorine, fluorine and bromine;

X is C_1–C_8 straight chained alkyl; and

M is a C_1–C_8 straight or branch chained alkyl, C_2–C_8 straight or branch chained alkenyl, C_2–C_8 straight or branch chained alkynyl, —$CH_2COOCH_2CH_3$, —CH_2CONH_2, —$CH_2CON(CH_2CH_3)_2$, or —$CH_2CH_2OCH_3$; which process comprises reacting an effective amount of an enzyme selected from the group consisting of Pseudomonas lipase, *Candida cylindracea* lipase, and Chromobacterium lipase with a diester compound of the formula:

II



5,070,023

AQUEOUS FERRIOXALATE COMPOSITIONS USEFUL AS CALIBRANTS

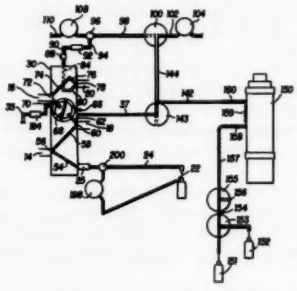
Gary S. Calabrese, North Andover, Mass., assignor to Fisher Scientific Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 257,553, Oct. 14, 1988. This application Feb. 3, 1989, Ser. No. 305,567

The portion of the term of this patent subsequent to Oct. 29, 2008, has been disclaimed.

Int. Cl.[5] G01N *31/00*

U.S. Cl. 436—8 **19 Claims**



1. An aqueous solution having a pH of 0 to 5 and comprising 0.3 to 15 millimoles per liter oxalate and 1.5 to 200 millimoles per liter of iron (III); the molar ratio of iron (III) to oxalate being 5:1 to 100:1.

5,070,024

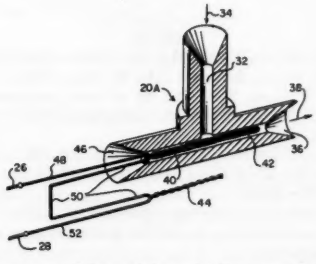
HYDROCARBON DETECTOR UTILIZING CATALYTIC CRACKING

Thomas J. Bruno, Broomfield, Colo., assignor to Gas Research Institute, Chicago, Ill.

Filed Jul. 12, 1988, Ser. No. 218,088

Int. Cl.[5] C01N *27/16*

U.S. Cl. 436—139 **17 Claims**



16. A process of determining whether a crackable gas is present by determining whether cracking is taking place within a gas composition, comprising the steps of:

placing said gas composition within a gas chamber means, which gas chamber means is within a heat chamber means for maintaining said gas chamber means at a temperature which will support hydrocarbon cracking activity;

placing a first means for sensing temperature inside said gas chamber means;

maintaining a second means for sensing temperature within said heat chamber means at a temperature substantially equal to the temperature inside said gas chamber means;

positioning a hydrocarbon cracking catalyzing material in thermally responsive relation with said first temperature sensing means; and

measuring an electrical output from said first and second temperature sensing means;

whereby a predetermined electrical output from said first and second temperature sensing means indicates whether cracking is taking place, and therefore the presence of crackable hydrocarbon gases in the gas composition.

5,070,025

PROCESS FOR THE DETERMINATION OF A PROTEIN ACCORDING TO FLUORESCENCE POLARIZATION IMMUNOASSAY PRINCIPLE

Christian Klein, Weilheim; Hans-Georg Batz, Tutzing; Ulrich Essig, Planegg, and Kurt W. Naujoks, Penzberg, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 311,100

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1988, 3806430

Int. Cl.[5] G01N *33/533*

U.S. Cl. 436—546 **8 Claims**

1. Method for determining a protein using a homogeneous fluorescence polarization immunoassay comprising simultaneously incubating a sample solution with

a) a peptide amino acid sequence labelled with a fluorescing compound, said sequence having from 6 to 14 amino acids, two of which must be cysteine residues, wherein said two cysteine residues form a disulphide bridge with one another, said amino acid sequence corresponding to an epitope of the protein to be determined, and

b) an antibody which specifically binds to both said protein and to the peptide amino acid sequence, wherein said antibody has a molar relative affinity for the peptide amino acid sequence labelled with a fluorescing compound and a molar relative affinity for the protein to be determined, which affinities differ by no more than a factor of 6, and measuring depolarization of polarized light which has been passed through said sample solution as a determination of protein therein.

5,070,026

PROCESS OF MAKING A FERROELECTRIC ELECTRONIC COMPONENT AND PRODUCT

Anton C. Greenwald, North Andover, and Bobby L. Buchanan, Carlisle, both of Mass., assignors to Spire Corporation, Bedford, Mass.

Filed Jun. 26, 1989, Ser. No. 371,548

Int. Cl.[5] H01L *31/18, 21/00*

U.S. Cl. 437—3 **11 Claims**

1. An MOCVD process of making a nonvolatile random access memory component comprising:

(a) forming by MOCVD a first subassembly on a first substrate;

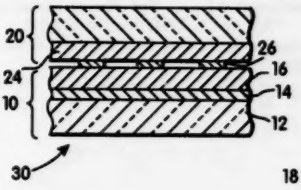
(b) depositing by MOCVD a smooth conductive layer of a noble metal on said first substrate;

(c) depositing by MOCVD a ferroelectric material on said smooth conductive layer;

(d) forming MOCVD a second subassembly on a second substrate, said first substrate and said second substrate being formed of the same material;

(e) depositing by MOCVD an integrated circuit on said second substrate;

(f) forming a plurality of electrical contacts on said integrated circuit; and



(c) connecting said two subassemblies by placing one on top of the other such that said electrical contacts abut said layer of ferroelectric material.

5,070,027

METHOD OF FORMING A HETEROSTRUCTURE DIODE

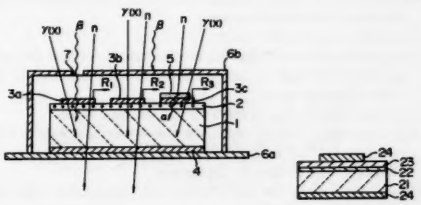
Yoshio Mito, Minoo; Masatoshi Kitagawa, Hirakata; Takashi Hirao, Moriguchi; Yoshitake Yasuno, Kyoto, and Ryuma Hirano, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 23, 1990, Ser. No. 483,872

Claims priority, application Japan, Feb. 23, 1989, 1-43706; Feb. 23, 1989, 1-43707; Mar. 30, 1989, 1-80347

Int. Cl.[5] H01L *21/04*

U.S. Cl. 437—15 **5 Claims**



2. A process of producing a heterostructure diode comprising the steps of:

forming a thin first amorphous semiconductor film containing hydrogen including active hydrogen, on a single crystal substrate with a low RF power by use of a plasma CVD device so as to obtain a first heterostructure lamination having an interface between said first amorphous semiconductor film and said single crystal substrate;

forming an additional amorphous semiconductor film on said first amorphous semiconductor film with an RF power which is higher than said low RF power by use of said plasma CVD device;

repeating said step of forming additional amorphous semiconductor film while successively increasing RF power so as to obtain a lamination having first to n-th semiconductor films laminated one upon another on said single crystal substrate;

forming electrodes on both surfaces of said lamination so as to obtain a heterostructure diode; and annealing said heterostructure diode at a temperature of 100 to 300 deg. C. so as to allow said active hydrogen to cover defects caused by plasma damage at said interface.

5,070,028

METHOD FOR MANUFACTURING BIPOLAR TRANSISTORS HAVING EXTREMELY REDUCED BASE-COLLECTION CAPACITANCE

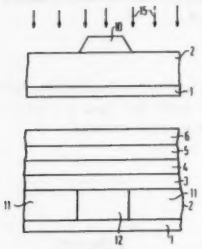
Helmut Tews, Unterhaching, and Hans-Peter Zwicknagl, Stuttgart, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Apr. 1, 1991, Ser. No. 678,047

Claims priority, application Fed. Rep. of Germany, Jun. 7, 1990, 4018298

Int. Cl.[5] H01L *21/266, 27/06, 27/10, 21/263*

U.S. Cl. 437—22 10 Claims



1. In a method for manufacturing a bipolar transistor arranged on a substrate of semiconductor material, and of the type in which a collector layer, a base layer and an emitter layer for the formation of a collector, a base and an emitter are grown on the substrate on top of one another, the improvement comprising the steps of:

(a) prior to the growing of the collector layer, the base layer and the emitter layer, applying a highly-doped sub-collector layer onto the substrate;

(b) masking the sub-collector layer with a first mask to cover only that portion allocated to the sub-collector to be formed;

(c) insulating the uncovered areas of the sub-collector layer by insulation implantation;

(d) removing the first mask;

(e) growing the collector layer, the base layer and the emitter layer in that sequence on top of one another on the sub-collector layer;

(f) applying a cover layer over the emitter layer;

(g) applying a second mask on the cover layer to cover a portion of the emitter layer therebelow and define the limits of the emitter to be formed;

(h) etching away the cover layer and the emitter layer outside of the defined emitter area covered by the second mask; and

(i) removing the second mask.

5,070,029

SEMICONDUCTOR PROCESS USING SELECTIVE DEPOSITION

James R. Pfiester, and James D. Hayden, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 428,721, Oct. 30, 1989, Pat. No. 5,010,030. This application Feb. 4, 1991, Ser. No. 650,324

Int. Cl.[5] H01L *21/265*

U.S. Cl. 437—29 4 Claims

1. A process for fabricating a semiconductor device comprising the steps of providing a semiconductor substrate;

forming a first insulating layer overlaying said substrate;

forming a nucleating layer overlaying said first insulating layer;

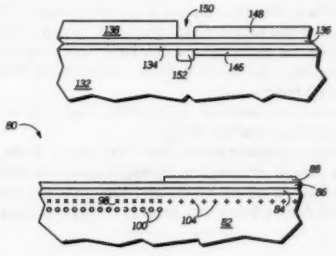
forming a second insulating layer overlaying said nucleating layer;

forming a first masking element overlaying selected portions of said second insulating layer;

removing portions of said second insulating layer not overlaid by said first masking element using said first masking element as a removal mask and thereby exposing portions of said nucleating layer;

implanting first ions into said substrate using said first masking element as an implantation mask;

removing said first masking element;



depositing by a process of selective deposition a second masking element onto said exposed portions of said nucleating layer;

implanting second ions into said substrate using said second masking element as an implantation mask.

5,070,030

METHOD OF MAKING AN OXIDE ISOLATED, LATERAL BIPOLAR TRANSISTOR

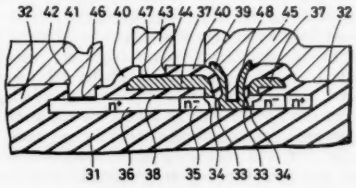
Tatsuhiko Ikeda; Kazuyuki Sugahara; Shigeru Kusunoki, and Kyusaku Nishioka, all of Itami, Japan, assignors to Mitsubishi Denki Kabuskiki Kaisha, Tokyo, Japan

Division of Ser. No. 115,049, Oct. 30, 1987, abandoned. This application Oct. 31, 1990, Ser. No. 606,828

Claims priority, application Japan, Dec. 1, 1986, 61-287325

Int. Cl.[5] H01L *27/082*

U.S. Cl. 437—31 2 Claims



1. A method of manufacturing a bipolar transistor for achieving high-speed operation, said method comprising:

a first step of oxidizing the surface of a semiconductor substrate for forming a first conductivity type monocrystal silicon layer on the same;

a second step of forming an isolation region by an insulation film for inter-element isolation on a region of said monocrystal silicon layer other than an element region;

a third step of introducing first conductivity type impurity into a region of said monocrystal silicon layer close to said isolation film for inter-element isolation and activating said impurity by heat treatment to form a collector electrode extracting layer;

a fourth step of forming a first insulation layer on said monocrystal silicon layer and said insulation film for inter-element isolation and further depositing a first polycrystal silicon layer introduced with second conductivity type impurity;

a fifth step of partially opening said first polycrystal silicon layer on said element region and subsequently opening said first insulation layer for partially exposing a surface

region of said monocrystal silicon layer other than a part provided with said collector electrode extracting layer;

a sixth step of depositing a second conductivity type second polycrystal silicon layer on said first polycrystal silicon layer and said exposed region of said monocrystal silicon layer;

a seventh step of diffusing second conductivity type impurity from said first and second polycrystal silicon layers into said monocrystal silicon layer by heat treatment for forming a second conductivity type monocrystal silicon layer on a surface part of said first conductivity type monocrystal silicon layer;

an eighth step of partially removing said first and second polycrystal silicon layers and said first and second conductivity type monocrystal silicon layers by anisotropic etching over the entire chip surface to leave a polycrystal silicon layer having a side wall region connected with said second conductivity type monocrystal silicon layer only on said first insulation layer;

a ninth step of patterning said polycrystal silicon layer formed in said eighth step to serve as an electrode extracting region of said second conductivity type monocrystal silicon layer;

a tenth step of depositing a nitride film over the entire chip surface and thereafter performing anisotropic etching for forming a side wall of said nitride film only on side walls of said first and second conductivity type monocrystal silicon layers and a part of said polycrystal silicon layer;

an eleventh step of oxidizing the entire chip surface and thereafter removing said nitride film formed in said tenth step;

a twelfth step of depositing a second conductivity type third polycrystal silicon layer on the entire chip surface and thereafter diffusing second conductivity type impurity from said third polycrystal silicon layer to said first and second conductivity type monocrystal silicon layers by heat treatment;

a thirteenth step of coating an insulating material containing high concentration of first conductivity type impurity on the entire chip surface and thereafter diffusing said first conductivity type impurity from said insulating material into said third polycrystal silicon layer and a part of said second conductivity type monocrystal silicon layer by heat treatment;

a fourteenth step of removing said insulating material and thereafter patterning said third polycrystal silicon layer to serve as an electrode extracting region of said first conductivity type diffusion layer formed in said monocrystal silicon layer in said thirteenth step;

a fifteenth step of forming contact holes in said insulation layer on said collector electrode extracting layer formed in said third step and in said insulation layer on said polycrystal silicon layer formed in said eighth step respectively; and

a sixteenth step of forming a collector electrode interconnection layer connected to said collector electrode extracting region through said contact hole, a base electrode interconnection layer connected to said polycrystal silicon layer formed in said eighth step through said contact hole and an emitter electrode interconnection layer directly connected to said third polycrystal silicon layer.

5,070,031

COMPLEMENTARY SEMICONDUCTOR REGION FABRICATION

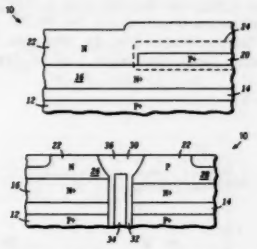
Peter J. Zdebel, Starnberg, Fed. Rep. of Germany, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 14, 1990, Ser. No. 627,477
Int. Cl.[5] H01L *21/22*
U.S. Cl. 437—33 **21 Claims**

1. A method of forming semiconductor regions of opposite conductivity type comprising the steps of:

providing a first semiconductor layer of a first conductivity type;

forming a second semiconductor layer of a second conductivity type on a first portion of said first layer so that a second portion of said first layer remains exposed; and



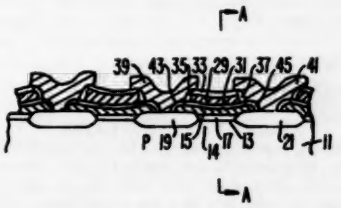
forming a third semiconductor layer of the first conductivity type on said second layer and said exposed second portion of said first layer, the dopant concentration of said third layer being less than the dopant concentration of said second layer so that dopant of the second conductivity type diffuses from said second layer into the portion of said third layer disposed thereabove.

5,070,032

METHOD OF MAKING DENSE FLASH EEPROM SEMICONDUCTOR MEMORY STRUCTURES

Jack H. Yuan, Cupertino, and Eliyahou Harari, Los Gatos, both of Calif., assignors to SunDisk Corporation, Santa Clara, Calif.

Filed Mar. 15, 1989, Ser. No. 323,779
Int. Cl.[5] H01L *21/265*
U.S. Cl. 437—43 **30 Claims**



1. A method of forming a two dimensional array of flash electrically erasable and programmable read only memory cells on a semiconductor substrate, comprising the steps of:

forming a first plurality of continuous elongated parallel strips of conductive material on said substrate in a manner to be insulated therefrom by a first dielectric layer,

forming a second plurality of continuous elongated parallel strips of conductive material on said substrate and over said first plurality of conductive strips in a manner to be insulated therefrom by a second dielectric layer, said first and second plurality of strips having their lengths oriented substantially orthogonal to each other,

thereafter forming spacers along opposing edges of adjacent ones of said second plurality of parallel strips and extending toward each other but leaving a defined space therebetween, and

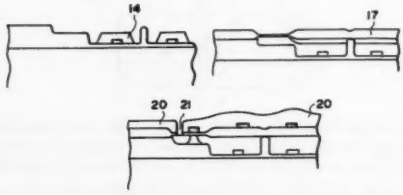
thereafter forming a gap in said first plurality of strips through the space defined by the spacers, thereby forming electrically isolated floating gates from said first plurality of strips.

5,070,034

PROCESS FOR PRODUCING A SEMICONDUCTOR MEMORY DEVICE

Tamotsu Satoh; Takao Yonehara, and Yoshio Nakamura, all of Atsugi, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 361,680, Jun. 2, 1989, abandoned, which is a continuation-in-part of Ser. No. 96,503, Sep. 15, 1987, abandoned. This application Sep. 28, 1990, Ser. No. 590,585
Claims priority, application Japan, Sep. 18, 1986, 61-218139
Int. Cl.[5] H01L *21/70*
U.S. Cl. 437—52 **3 Claims**



1. A process for producing a semiconductor memory device provided with memory cells, each said memory cell having a capacitor for accumulating an electric charge and a transistor for charging and discharging said capacitor, said capacitor comprising a substrate, an insulator layer disposed on said substrate and a monocrystalline semiconductor layer on said insulator layer, said method comprising the steps of:

(a) forming, on said insulator layer provided on said substrate, an amorphous nucleation surface with a different material of a nucleation density sufficiently larger than that of the material constituting said insulator layer and of a size sufficiently small as to allow the growth of only one nucleus;

(b) growing a single crystal from the single nucleus of a semiconductor material grown on said amorphous nucleation surface to form a monocrystalline semiconductor layer; and

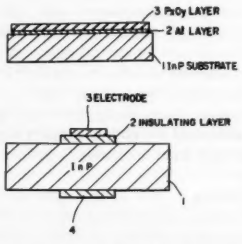
(c) forming said transistor in said monocrystalline semiconductor layer.

5,070,035

METHOD FOR PRODUCING A III-V COMPOUND SEMICONDUCTOR DEVICE WITH A PHOSPHORIC OXIDE INSULATING LAYER

Kazuo Hattori, Toyohashi, and Mitsuhiro Taniguchi, Toda, both of Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

PCT No. PCT/JP89/00060, § 371 Date Aug. 21, 1989, § 102(e) Date Aug. 21, 1989, PCT Pub. No. WO89/06863, PCT Pub. Date Jul. 27, 1989
PCT Filed Jan. 24, 1989, Ser. No. 415,306
Claims priority, application Japan, Jan. 25, 1988, 63-15286; Apr. 4, 1988, 63-83297
Int. Cl.[5] H01L *21/441*
U.S. Cl. 437—184 **9 Claims**



2. A method for producing III-V group compound semiconductor device comprising the steps of forming an aluminium layer or an indium layer is formed on III-V group compound semiconductor substrate including indium and/or phosphorus, the substrate is subjected to a first heat treatment, an insulating layer composed of phosphoric acid P_xO_y ($x>0$, $Y>0$) is formed on the aluminium layer or the indium layer, the substrate is subjected to a second heat treatment, and finally an electrode metal layer is formed on the insulating layer.

3. A method for producing a semiconductor device, comprising the steps of:

forming a P_xO_y ($x>0$, $y>0$) insulating layer on a III-V group compound semiconductor substrate including indium and/or phosphorus;

subjecting the substrate having the insulating layer to a heat treatment; and

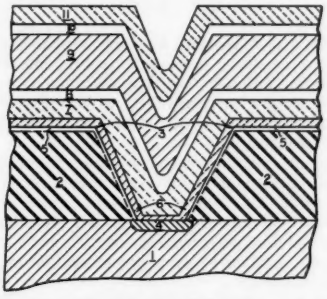
forming an electrode metal layer on the insulating layer.

5,070,036

PROCESS FOR CONTACTING AND INTERCONNECTING SEMICONDUCTOR DEVICES WITHIN AN INTEGRATED CIRCUIT

E. Henry Stevens, Colorado Springs, Colo., assignor to Quality Microcircuits Corporation, Colorado Springs, Colo.

Division of Ser. No. 293,438, Jan. 4, 1989, Pat. No. 4,977,440. This application May 18, 1990, Ser. No. 525,444
Int. Cl.[5] H01L *21/44*
U.S. Cl. 437—190 **17 Claims**



1. A process for forming a multi-region material structure for contacting and interconnecting semiconductor devices within a VLSI circuit, the process comprising:

providing a semiconductor wafer upon which the multi-region material structure is to be formed;

providing a first dielectric region overlying the semiconductor wafer, said first dielectric region including openings therein for permitting electrical contact to terminals of the semiconductor devices;

providing a low-resistance contact region in the semiconductor wafer underlying the openings in said first dielectric region;

providing a first metallurgic barrier region overlying the first dielectric region and the low-resistance contact region, said first metallurgic barrier region comprising a compound of a refractory metal, oxygen, and nitrogen, said compound being established by a process that causes oxygen to be incorporated within said refractory metal and by a further process that includes reacting in a nitrogen-containing atmosphere;

providing a first material bonding region sandwiched between said first metallurgic barrier region and said first dielectric region;

providing a metallurgic barrier and current carrying region overlying said first metallurgic barrier region, said metallurgic barrier and current carrying region comprising a compound of a refractory metal, oxygen, and nitrogen that is different from the compound comprising said first

metallurgic barrier region, said-metallurgic barrier and current carrying region having a resistivity of less than 60 micro-ohm-centimeters, said compound comprising said metallurgic barrier and current carrying region being established by a process that includes reactive sputter deposition;

providing a primary current carrying path region overlying said metallurgic barrier and current carrying region, for providing, in combination with said metallurgic barrier and current carrying region, a composite path for carrying current between interconnected semiconductor devices; and

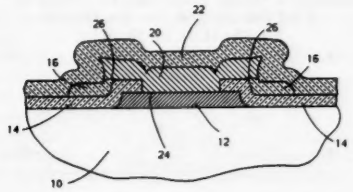
providing a second material bonding region sandwiched between said metallurgic barrier and current carrying region and said primary current carrying path region.

5,070,037

INTEGRATED CIRCUIT INTERCONNECT HAVING DUAL DIELECTRIC INTERMEDIATE LAYER

Ronald K. Leisure, Kokomo; Oya F. Larsen, Amboy, and Ronald K. Reger, Noblesville, all of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Aug. 31, 1989, Ser. No. 401,311
Int. Cl.[5] H01L *21/90*
U.S. Cl. 437—195 **5 Claims**



1. A method for forming an integrated circuit having a multilevel conductive interconnection comprising the following steps:

providing an appropriate semiconductive integrated circuit substrate;

forming a first metal pattern on said substrate;

forming a blanket first dielectric layer of a first dielectric material on said first metal pattern so that said first dielectric material layer completely covers said first metal pattern;

patterning said first dielectric layer to form an opening that exposes a selected surface portion of said first metal pattern;

forming a blanket second dielectric layer of a second dielectric material on said first patterned dielectric layer so as to form a dual layer dielectric coating consisting of said first dielectric layer and said second dielectric layer, said second dielectric material being an organic material resistant to degradation at elevated temperatures; and

patterning said second dielectric layer to form an opening in the second dielectric layer that wholly surrounds said opening in said first dielectric layer, effective to expose a surface of said first dielectric layer contiguous said exposed part of said selected portion of said first metal pattern,

forming a second metal pattern upon said dual layer dielectric coating, said second metal pattern having a portion covering said opening in said second dielectric layer, so that said second metal pattern contacts said first metal pattern at said exposed part of said first metal pattern;

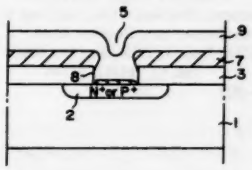
effective to form a multilevel conductive interconnect having said dual dielectric coating intermediate said different levels of metal conductor everywhere except at said exposed part of said first metal pattern, where said metal patterns contact each other.

5,070,038

METHOD OF FORMING LOW-RESISTIVE CONTACT TO N+/P+ PREOHMIC REGIONS IN VERY LARGE SCALE INTEGRATED DEVICES

Dae-Je Jin, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 27, 1988, Ser. No. 289,732
Claims priority, application Rep. of Korea, Dec. 24, 1988, 1224
Int. Cl.[5] H01L *21/40, 21/283*
U.S. Cl. 437—200 **34 Claims**



1. A method of forming low-resistive contacts to at least two preohmic regions formed in a silicon substrate, comprising the steps of:

forming an insulating layer on the face of the silicon substrate;

depositing a polycrystalline silicon layer on the insulating layer;

forming holes having features of vertical side-walls in the insulating layer and the polycrystalline silicon layer so that face portions of the preohmic regions are completely exposed;

depositing titanium on the polycrystalline silicon layer and the exposed preohmic regions;

forming a layer of titanium silicide so that the titanium reacts with the underlying silicon; and

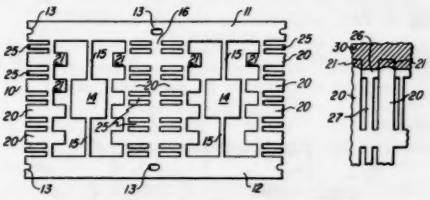
depositing a metal silicide on the titanium silicide layer and the side-walls of the insulating layer.

5,070,039

METHOD OF MAKING AN INTEGRATED CIRCUIT USING A PRE-SERVED DAM BAR TO REDUCE MOLD FLASH AND TO FACILITATE FLASH REMOVAL

Richard E. Johnson, Carrollton; Dennis D. Davis, Garland; David R. Kee; John W. Orcutt, both of Richardson, all of Tex., and Angus W. Hightower, Singapore, assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 13, 1989, Ser. No. 337,609
Int. Cl.[5] H01L *21/56, 21/84*
U.S. Cl. 437—207 **3 Claims**



1. A process for assembling an integrated circuit comprising the steps of:

providing a lead frame with at least one pair of adjoining leads and a dam bar having a transverse portion extending between said leads and having a lateral portion, narrower than said transverse portion and extending from the transverse portion to a supporting web;

entirely severing the transverse portion of said dam bar from the leads;

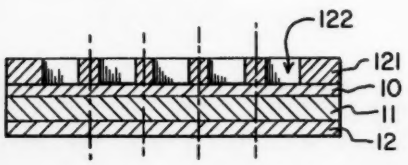
joining an integrated circuit to the leads;
subsequently encapsulating the integrated circuit in an insulating, molding compound;
defining the outer molded edge of the molding compound between the leads with the entirely severed transverse portion of said dam bar; and
finally severing the lateral portion of the dam bar from the supporting web.

5,070,040

METHOD AND APPARATUS FOR SEMICONDUCTOR CIRCUIT CHIP COOLING

Jacques I. Pankove, Boulder, Colo., assignor to University of Colorado Foundation, Inc., Boulder, Colo.

Filed Mar. 9, 1990, Ser. No. 490,878
Int. Cl.[5] H01L *23/46*
U.S. Cl. 437—209 **21 Claims**



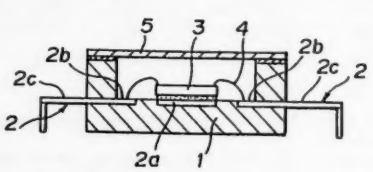
1. A method providing a cooled semiconductor chip, comprising,
providing a passive semiconductor substrate member having oppositely disposed first and second surfaces,
synthetically depositing a diamond layer on the first surface of said passive semiconductor substrate member, said diamond layer having an exposed surface,
depositing an active semiconductor substrate layer on the exposed surface of said diamond layer,
forming integrated circuit means in said active semiconductor substrate layer,
removing a portion of said passive semiconductor substrate member from said second surface thereof to expose an underlying surface of said diamond layer, and
placing a cooling medium in heat transfer relation with the exposed underlying surface of said diamond layer.

5,070,041

METHOD OF REMOVING FLASH FROM A SEMICONDUCTOR LEADFRAME USING COATED LEADFRAME AND SOLVENT

Shigeru Katayama; Kaoru Tominaga; Toshio Suetsugu, and Kazumi Matsumoto, all of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Aug. 10, 1989, Ser. No. 391,986
Claims priority, application Japan, Aug. 12, 1988, 63-201464; Aug. 31, 1988, 63-219488; Sep. 13, 1988, 63-228957
Int. Cl.[5] H01L *21/56*
U.S. Cl. 437—214 **12 Claims**



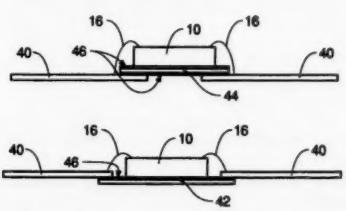
1. A process for producing a semiconductor device which is received in a concavity of a core-box resin molded item, said process comprising the steps of:
coating a lead frame on its portions expected to be in non-contact with said core-box resin molded item with an organic high molecular substance having a melting or softening point higher than the molding temperature of a resin constituting said one-box resin molded item and soluble in a solvent which does not dissolve said core-box resin molded item, the organic high molecular substance being selected from the group consisting or cellulose derivatives and epoxy resins;
placing the thus coated lead frame in position within a mold and injecting said resin into said mold, thereby obtaining the core-box resin molded item integrated with the lead frame;
immersing the lead frame of the core-box resin molded item into said solvent to dissolve said organic high molecular substance coated on said lead frame;
die-bonding said semiconductor element to an island of said lead frame and then wire bonding electrodes of said semiconductor element to said lead frame; and
fusion-bonding a covering member of said core-box resin molded item to seal hermetically the whole concavity of said core-box resin molded item.

5,070,042

METHOD FOR ATTACHING A SEMICONDUCTOR DIE TO A LEADFRAME USING A THERMOPLASTIC COVERED CARRIER TAPE

Rich Fogal; Jerrold L. King, and Walter L. Moden, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Oct. 24, 1990, Ser. No. 602,990
Int. Cl.[5] H01L *21/58, 21/60*
U.S. Cl. 437—220 **13 Claims**



1. A method of attaching a semiconductor die to a leadframe, comprising the steps of:
a) applying a thermoplastic to a first side of a carrier material, said thermoplastic having a physical property such that as it is heated it softens and flows, and as it cools to its preheated temperature it returns to its preheated state, and said thermoplastic further being such that said heating and cooling can be performed more than once with said thermoplastic maintaining its resiliency when heated;
b) applying an adhesive to a second side of said carrier material;
c) contacting said second side of said carrier material to the leadframe;
d) placing said semiconductor die on said first side of said carrier material;
e) heating said thermoplastic to its soft state; and
f) cooling said thermoplastic to its preheated state, thereby bonding said die to said carrier material.

5,070,043

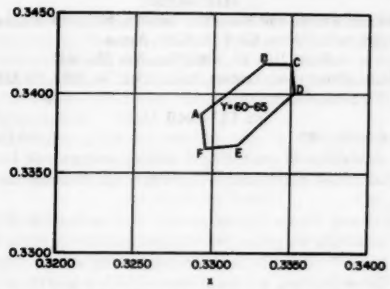
COLORED GLASS-CERAMICS

W. Duane Amundson, Jr., Caton, and Jaroslava M. Nigrin, Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Oct. 26, 1990, Ser. No. 603,407
Int. Cl.[5] C03C *10/16, 3/087*
U.S. Cl. 501—3 **6 Claims**

1. An opaque, beige-tinted, glass-ceramic material that has a predominant crystal phase of potassium fluorrichterite and a

secondary phase of cristobalite „ amounting to at least 10% by volume, that has an overall composition including a base glass



consisting essentially of, in weight percent as calculated from the batch on an oxide basis,

SiO_2	65–69	Na_2O	1.5–3.3
Al_2O_3	0.75–3.5	K_2O	4.2–6.0
MgO	13.5–17.5	BaO	0–2.5
CaO	3–4.8	P_2O_5	0–2.5
Li_2O	0.5–2.0	F	3.3–5.5

includes a combination of colorants selected from the following ranges,

0.065–0.16% Fe_2O_3
0.055–0.16% NiO
0.0015–0.0029% Se
0–0.0014% Co_3O_4

and, in conjunction with a glaze, exhibits x and y color coordinates (Illuminant C) falling within the polygon ABCDEFA defined in FIG. 1 of the appended drawing.

5,070,044

BRIGHTLY COLORED CANASITE GLASS-CERAMICS

Linda R. Pinckney, Corning, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Jan. 28, 1991, Ser. No. 646,430
Int. Cl.[5] C03C *10/16*
U.S. Cl. 501—3 **7 Claims**

1. An opaque glass-ceramic article in a mildly reduced state exhibiting strong bright coloration ranging from yellow-to-orange-to-red-to-brown containing canasite crystals as the predominate crystal phase, said glass-ceramic article consisting essentially, expressed in the terms of weight percent on the oxide basis, of about 45–75% SiO_2, 8–30% CaO, 3.5–12% F, 3–15% Na_2O, 0–20% K_2O, 5–25% Na_2O+K_2O, 0–6% B_2O_3, 0–7% Al_2O_3, 0–12% ZrO_2, and 0.1–2.5% total of at least one member selected from the group consisting of CdS, Se and CdO, the maximum amount of any individual member being about 2.0%.

5,070,045

TRANSPARENT GLASS-CERAMIC ARTICLES

Marie J. M. Comte, Velizy; Paul L. Netter, Paris, and Daniel L. G. Ricoult, Palaiseau, all of France, assignors to Corning Europe, Inc., Avon Cedex, France

Filed Nov. 30, 1990, Ser. No. 620,091
Claims priority, application France, Jan. 12, 1990, 90 00326
Int. Cl.[5] C03L *10/14*
U.S. Cl. 501—4 **28 Claims**

1. A thermally crystallizable glass exhibiting a liquidus viscosity greater than 700 Pa.s which can be thermally crystallized in situ to a transparent glass-ceramic article demonstrating a linear coefficient of thermal expansion (20°–700° C.) of $0\pm3\times10^{-7}$/°C., containing β-quartz solid solution as the predominant crystal phase, and capable of being crystallized in situ to a plate form exhibiting a distortion of less than 0.1% of its diagonal dimension when subjected to a very short thermal crystallization treatment, said glass consisting essentially, expressed in terms of weight percent on the oxide basis, of

SiO_2	65–70	MgO + BaO + SrO	1.1–2.3
Al_2O_3	18–19.8	ZrO_2	1.0–2.5
Li_2O	2.5–3.8	As_2O_3	0–1.5
MgO	0.55–1.5	Sb_2O_3	0–1.5
ZnO	1.2–2.8	$As_2O_3 + Sb_2O_3$	0.5–1.5
TiO_2	1.8–3.2	Na_2O	0–<1.0
BaO	0–1.4	K_2O	0–<1.0
SrO	0–1.4	$Na_2O + K_2O$	0–<1.0
BaO + SrO	0.4–1.4	$2.8Li_2O + 1.2ZnO/5.2MgO$	>1.8

5,070,046

DIELECTRIC COMPOSITIONS

Yung-Haw Hu, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 19, 1989, Ser. No. 423,367
Int. Cl.[5] C03C *10/08*
U.S. Cl. 501—9 **20 Claims**

1. A composition for making low K dielectric layers comprising a dispersion of finely divided solids comprising:

(a) 20–50% by weight, basis total solids, lead-free amorphous borosilicate glass (1) in which the weight ratio of B^2O^3 to SiO^2 is 0.22–0.55, and (2) containing, basis total borosilicate glass 94.5–98.3% by weight borosilicate, 0.5–1.5% by weight Al^2O^3, and 1.5–4.0% by weight, of alkali oxides of a mixture of alkali and alkaline earth oxides wherein the Li^2O content of total solids is 0.3–1.0% by weight;

(b) 30–80% by weight, basis total solids, cordierite glass; and

(c) 0–40% by weight, basis total solids, of a ceramic filler selected from the group consisting of alumina, quartz, aluminum phosphate, aluminum nitride, boron nitride, fused silica, and mixtures thereof.

5,070,047

DIELECTRIC COMPOSITIONS

Robert D. Gardner, Warrensville Hts.; Dineen M. Hopp, Twinsburg, both of Ohio; Aziz S. Shaikh, Ventura, Calif., and Gordon J. Roberts, Parma, Ohio, assignors to Ferro Corporation, Cleveland, Ohio

Continuation of Ser. No. 377,551, Jul. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 221,105, Jul. 19, 1988. This application Jan. 14, 1991, Ser. No. 640,590
Int. Cl.[5] C03C *8/22*
U.S. Cl. 501—16 **29 Claims**

1. A dielectric composition formed by firing a composition comprising:

(a) about 30% to about 100% by weight of a glass composition selected from the group consisting of:

(a-1) a mixture of two compositions comprising a first glass composition having a glass transition temperature in the range of about 585° C. to about 620° C. and a second glass composition having a glass transition temperature in the range of about 765° C. to about 815° C.; or

(a-2) a mixture of three glass compositions comprising a first glass composition having a glass transition temper-

ature in the range of about 585° C. to about 620° C., a second glass composition having a glass transition temperature in the range of about 765° C. to about 815° C., and a third glass composition having a glass transition temperature in the range of about 650° C. to about 720° C.;

(b) up to about 30% by weight of at least one expansion modifier; and

(c) up to about 40% by weight of at least one refractory oxide,

said first glass composition of (a-1) comprising from about 45% to about 60% by weight SiO_2, from about 2% to about 7% by weight B_2O_3, from about 14% to about 20% by weight PbO, from about 5% to about 12% by weight Al_2O_3, up to about 3% by weight MgO, from about 4% to about 12% by weight CaO, up to about 3% by weight K_2O, and up to about 3% by weight Na_2O; and said second glass composition of (a-1) comprising from about 43% to about 56% by weight SiO_2, from about 20% to about 31% by weight Al_2O_3, from about 20% to about 27% by weight MgO, and up to about 2% by weight CaO; and

said first glass composition of (a-2) comprising from about 45% to about 60% by weight SiO_2, from about 2% to about 7% by weight B_2O_3, from about 14% to about 20% by weight PbO, from about 5% to about 12% by weight Al_2O_3, up to about 3% by weight MgO, from about 4% to about 12% by weight CaO, up to about 3% by weight K_2O, and up to about 3% by weight Na_2O; said second glass composition of (a-2) comprising from about 43% to about 56% by weight SiO_2, from about 20% to about 31% by weight Al_2O_3, from about 20% to about 27% by weight MgO, and up to about 2% by weight CaO; and said third glass composition of (a-2) comprising from about 30% to about 60% by weight SiO_2, from about 35% to about 65% by weight CaO, and from about 1% to about 15% by weight B_2O_3.

5,070,048

BLUE GLASS COMPOSITIONS

Edward N. Boulos, Troy; Mark F. Best, Taylor, and Roman Surowiec, Redford, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 12, 1990, Ser. No. 626,497

Int. Cl.[5] C03C *3/087*

U.S. Cl. 501—71 **2 Claims**

1. A blue-colored glass having an Illuminant C transmittance of 54%±3% at a glass thickness of one quarter inch, a dominant wavelength of 482 nm±1 nm, and a color purity of 13%±1%, consisting essentially of:

A. 68% to 75% by weight SiO_2;

B. up to 5% by weight Al_2O_3;

C. 5% to 15% by weight CaO;

D. up to 10% by weight MgO, wherein CaO+MgO is 6% to 15% by weight;

E. 10% to 18% by weight Na_2O;

F. up to 5% by weight K_2O, wherein Na_2O+K_2O is 10% to 20% by weight; and

G. colorant selected from the group consisting of:

i. 0.290% by weight Fe_2O_3, 0.0055% by weight Co_3O_4, and 0.0072% by weight NiO; and

ii. 0.430% by weight Fe_2O_3, 0.0054% by weight Co_3O_4, 0.0035% by weight NiO, and 0.00015% by weight selenium.

5,070,049

STARTING COMPOSITION FOR THE PRODUCTION OF SILICON CARBIDE AND METHOD OF PRODUCING THE SAME

Toshikazu Amino, and Satoshi Takenaka, both of Gifu, Japan, assignors to Ibiden, Co. Ltd., Gifu, Japan

Filed Dec. 19, 1988, Ser. No. 286,264

Claims priority, application Japan, Dec. 26, 1987, 62-331572; Jun. 27, 1988, 63-158359

Int. Cl.[5] C04B *35/56*

U.S. Cl. 501—88 **10 Claims**

1. A method of producing a starting composition for the production of silicon carbide powder, which comprises the steps of:

(a) mixing silicon dioxide powder with an amount of high molecular weight organic compound corresponding to 67 to 170% of the theoretical compounding amount required for carbonizing a given amount of SiO_2 in step (b) to form a kneaded mixture;

(b) heating the kneaded mixture by burning in an oxidizing air atmosphere to conduct a carbonization reaction of said high molecular weight organic compound to thereby form a porous carbonaceous substance, and at the same time uniformly dispersing said silicon dioxide into a matrix formed by said carbonaceous substance, to form a composite body; and

(c) granulating said composite body into granules having a grain size of 1 to 15 mm.

5,070,050

METAL OXIDE DIELECTRIC DENSE BODIES, PRECURSOR POWDERS THEREFOR, AND METHODS FOR PREPARING SAME

Ryan W. Dupon; Mark S. Thompson, both of San Carlos; Gary H. Wiseman, San Francisco; Douglas J. Musolf, Mountain View, and Adam C. Tanous, Woodside, all of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 258,272, Oct. 14, 1988, abandoned, and a continuation-in-part of Ser. No. 258,277, Oct. 14, 1988, abandoned, and a continuation-in-part of Ser. No. 258,278, Oct. 14, 1988, abandoned. This application Feb. 22, 1990, Ser. No. 483,597

Int. Cl.[5] C04B *35/04, 35/14, 35/18, 35/20*

U.S. Cl. 501—108 **12 Claims**

1. A metal oxide dielectric dense body consisting essentially of

(I) crystalline grains having a predominant crystalline phase selected from the group consisting of cordierite, magnesium oxide, mullite, mullite-silica, willemite, and silica, and

(II) between about 1 and about 20 atom % bismuth as bismuth oxide, discontinuously located at the boundaries of the crystalline grains or as inclusions in the crystalline grains, the atom %'s based on the total atoms of bismuth in the bismuth oxide and silicon, magnesium, aluminum, and zinc in the cordierite, magnesium oxide, mullite, mullite-silica, willemite, or silica;

the dense body having a density which is at least 95% of theoretical.

5,070,051

CATALYST COMPONENT AND CATALYST FOR THE PRODUCTION OF VERY HIGH MOLECULAR WEIGHT POLYOLEFINS

Francesco Masi, San Donato Milanese; Angelo Moalli, Castelletto Ticino; Renzo Invernizzi, Milan; Francesco Menconi, Massa Macinaia; Cesare Ferrero, Monza; Stefano Malquori, Castelfiorentino; Lia Barazzoni, Piacenza, and Mario Polesello, Oderzo, all of Italy, assignors to Enichem Anic S.p.A., Palermo, Italy

Continuation of Ser. No. 400,988, Aug. 31, 1989, abandoned. This application Feb. 22, 1991, Ser. No. 659,533

Claims priority, application Italy, Sep. 9, 1988, 21877 A/88

Int. Cl.[5] C08F *4/654*

U.S. Cl. 502—9 **7 Claims**

1. A catalyst component for the low-pressure polymerization of ethylene and C_3–C_{10} alpha-olefins into very high molecular weight polyolefins, being in the form of a spherical granular solid of which at least about 80% of the granules have a size of between 30 and 40 microns, and having a surface area of between 20 and 40 m^2/g, a mean pore radius of between 5,000 and 40,000 A and a porosity of between 40 and 90 vol % and being definable by the following formula (in atomic proportions):

X(1), Mg(1–8), Al(0.2–0.8), Cl(5–20), (Et+OEt+OR) (1–3);

where:

X=Hf or Zr,

Et=ethyl group,

OEt=ethoxy group,

OR=alkoxy group containing from 3 to 8 carbon atoms in the linear or branched alkyl portion;

produced by a process comprising:

(a) spray drying an ethanolic magnesium chloride solution to form a spherical granular solid support containing between 5 and 30% w/w of alcoholic hydroxyls (expressed as ethanol);

(b) reacting said support, suspended in an inert organic liquid, with a hafnium or zirconium compound chosen from those hafnium or zirconium alkoxides and halogenalkoxides containing from 2 to 8 carbon atoms in the linear or branched alkyl portion, operating at a temperature of between 40° and 100° C. for a time between 0.5 and 4 hours, with an atomic Mg/Hf or Zr ratio of between 0.5/1 and 8/1;

(c) reacting the support treated in this manner with an alkyl aluminum chloride containing from 2 to 8 carbon atoms in the linear or branched alkyl portion, operating at a temperature of between 60° and 120° C. for a time of between 0.5 and 5 hours, with a ratio of chlorine atoms in the alkyl aluminum chloride to alkoxy groups of between 1/1 and 5/1; and

(d) recovering the solid catalyst component from the relative suspension.

5,070,052

BASIC ZINC-CONTAINING ZEOLITE COMPOSITIONS

Thomas F. Brownscombe, Houston; Thomas C. Forschner, Richmond, and Lynn H. Slaugh, Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 21, 1990, Ser. No. 586,120

Int. Cl.[5] B01J *29/08, 29/18*

U.S. Cl. 502—60 **16 Claims**

1. A composition-of-matter prepared by impregnating a zeolite with a solution of a zinc or zinc plus alkali(ne earth) metal salt wherein the sum of said zinc or zinc plus alkali(ne earth) metal impregnated into the zeolite and any metal cation exchanged into the zeolite is in excess of that required to provide a fully metal cation-exchanged zeolite, drying the impregnated zeolite product and subsequently calcining the dried product at a temperature ranging from about 200° C. to about 750° C.

2. The composition-of-matter of claim **1** wherein, in the process for preparing the composition, the zeolite is first impregnated with a solution of a zinc and/or an alkaline earth metal salt and is subsequently contacted with a precipitating agent whereby an insoluble zinc and/or alkaline earth metal compound precipitates within the zeolite.

3. The composition-of-matter of claim **2** wherein the precipitating agent is an aqueous solution of a hydroxly-containing compound.

5,070,053

FCC CATALYST COMPOSITION AND METHOD OF MAKING SAME

Claude C. Culross; Gordon F. Stuntz, and William E. Winter, Jr., all of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 288,829, Dec. 23, 1988, abandoned, which is a continuation-in-part of Ser. No. 114,835, Oct. 30, 1987, abandoned. This application Dec. 21, 1990, Ser. No. 631,561

Int. Cl.[5] B01J *21/12, 29/08*

U.S. Cl. 502—64 **35 Claims**

1. A catalyst composite comprised of an alumina-on-silica material which is comprised of silica particles with surface bound aluminum groups chemically bonded to the silica surface through surface oxygen atoms, which material is dispersed in a matrix comprised of a refractory oxide, wherein said material is prepared by: (i) coating silica particles with an aluminum compound capable of being thermally converted to an alumina surface phase under the conditions of (ii) and (iii) hereof; (ii) treating the coated silica material of (i) to a heat soak at a temperature from about 90° C. to about 300° C., for an effective amount of time; and (iii) calcining the alumina coated silica material at a temperature from about 300° C. to about 1000° C.

5. The catalyst composite of claim **1** wherein the matrix is selected from alumina, silica and a silica-alumina.

11. The catalyst composite of claim **1** wherein a zeolite material is also present.

5,070,054

PROCESS FOR PREPARING A VANADIUM-BASED CATALYST SUITABLE FOR OLEFIN POLYMERIZATION

Jean-Claude A. Bailly, Martigues, and Philippe Bres, Fos-sur-Mer, both of France, assignors to BP Chemicals Limited, London, England

Filed Aug. 2, 1990, Ser. No. 561,786

Claims priority, application France, Aug. 8, 1989, 89 10856

Int. Cl.[5] C08F *4/646*

U.S. Cl. 502—104 **9 Claims**

1. Process for the preparation of a catalyst of Ziegler-Natta type based on a vanadium compound precipitated within a liquid hydrocarbon by reduction reaction of vanadium on a spherical support of magnesium chloride, a process characterized in that the precipitation is carried out by bringing into contact within the liquid hydrocarbon:

a) a vanadium-reducing agent chosen from organometallic compounds, with

b) a vanadium compound soluble in the liquid hydrocarbon, containing at least one halogen and one alkoxy group, and

c) a solid support containing (i) from 80 to 99.5 mol % of magnesium dichloride which is substantially free from any product containing an Mg—C bond, and (ii) from 0.5 to 20 mol % of at least one organic electron-donor compound, D, free from labile hydrogen, the said solid support consisting of spherical particles which have a mass-average diameter Dm of 10 to 100 microns and a narrow particle size distribution such that the ratio of Dm to the number-average diameter, Dn, of the particles is less than 2.

5,070,055

NOVEL COIMPREGNATED VANADIUM-ZIRCONIUM CATALYST FOR MAKING POLYETHYLENE WITH BROAD OR BIMODAL MW DISTRIBUTION

Kathleen D. Schramm, Neshanic, and Frederick J. Karol, Belle Mead, both of N.J., assignors to Union Carbide Chemicals and Plastics Technology Corporation, Danbury, Conn.

Filed Jun. 29, 1990, Ser. No. 545,577

Int. Cl.[5] C08F *4/68*

U.S. Cl. 502—107 **53 Claims**

7. A process for the manufacture of a vanadium and zirconium containing catalyst which comprises a multisequential impregnation procedure involving:

(i) sequentially impregnating an active carrier material with a liquid compound which is or contains a vanadium$^{(+3}$ *and higher)* compound followed by the reduction on the support of the vanadium compound by the deposition of a liquid reducing agent and effecting the formation of a reduced vanadium$^{(<3)}$ compound on the support surfaces or impregnating an active carrier with such reduced vanadium$^{(<3)}$ compound,

(ii) depositing a liquid zirconium organooxy compound onto the support,

(iii) providing an electron donor compound for the intercomplexation of the vanadium and zirconium compounds on the support surfaces,

(iv) drying the sequentially impregnated support to form a flowing powder, and

(v) impregnating the dried sequentially impregnated support with a Group 13 element-containing activating composition or compound.

5,070,056

ALKENE POLYMERIZATION PROCESS AND CATALYST COMPOSITIONS THEREFOR

Ian G. Carson, and Petrus A. Bentvelsen, both of Amsterdam, Netherlands, assignors to Shell Internationale Research Maatschappij, B.V., Netherlands

Division of Ser. No. 426,289, Oct. 25, 1987, Pat. No. 4,988,782. This application Oct. 29, 1990, Ser. No. 604,127

Claims priority, application United Kingdom, Oct. 26, 1988, 8825056

Int. Cl.[5] C08F *4/655*

U.S. Cl. 502—110 **5 Claims**

1. A process for the preparation of a catalyst composition for alkene polymerization which comprises combining:

(a) a solid catalyst component comprising a magnesium dihalide, an electron donor and a halide of tetravalent titanium,

(b) a tri-alkylaluminium compound,

(c) an electron donor, and

(d) a di-alkylaluminium halide, characterized in that the catalyst composition is prepared by combining the components in the following order of addition:

first introducing component (c),

then adding a reaction product of components (a) and (d), and

lastly adding component (b).

5,070,057

SIMPLIFIED POLYETHYLENE CATALYST SYSTEM

Kevin J. Cann, Rocky Hill; Frederick J. Karol, Belle Mead, both of N.J., and Arthur E. Marcinkowsky, Charleston, W. Va., assignors to Union Carbide Chemicals and Plastics Technology Corporation, Danbury, Conn.

Filed Apr. 2, 1990, Ser. No. 502,678

Int. Cl.[5] C08F *4/02*

U.S. Cl. 502—119 **42 Claims**

1. In a catalyst system for producing polyethylene comprising:

(a) a supported catalyst precursor comprising a siliceous carrier impregnated with:

(i) a vanadium compound which is the reaction product of a vanadium trihalide and a liquid, organic Lewis base electron donor in which the vanadium trihalide is soluble; and

(ii) a modifier having the formula:

$$MX_a$$

wherein M is either boron or $AlR_{(3-a)}$ and wherein each R is independently alkyl provided that the total number of aliphatic carbon atoms in any one R group may not exceed 14; X is chlorine, bromine, or iodine; and a is 1 or 2 with the provision that when M is boron, a is 3;

(b) an alkylaluminum cocatalyst; and

(c) an alkyl halide polymerization promoter;

the improvement which comprises utilizing a polymerization promoter which is chemically bound within the supported catalyst precursor as a result of molecular condensation of a hydrolyzably and/or condensibly-functional halohydrocarbon.

5,070,058

METHOD FOR MAKING A CATALYST COMPOSITION USED IN THE PRODUCTION OF LOWER ALIPHATIC ALCOHOLS

Robert A. Sawicki, Stormville, and Jeffrey B. Harrison, Fishkill, both of N.Y., assignors to Texaco, Inc., White Plains, N.Y.

Filed Jan. 22, 1990, Ser. No. 468,325

Int. Cl.[5] B01J *23/02, 23/06, 3/28, 23/72*

U.S. Cl. 502—206 **20 Claims**

1. A method for preparing a catalyst composition which comprises (a) vacuum impregnating a support with at least one catalytically active element and, thereafter, calcining said vacuum impregnated support and (b) vacuum impregnating said support with at least one other element to provide said catalyst composition.

5,070,059

CATALYST FOR PRODUCING AROMATIC NITRILES

Masao Saito, Tokyo; Kengo Tsukahara, Niigata; Noriko Takahashi, Niigata, and Yuzi Onda, Niigata, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Division of Ser. No. 336,475, Apr. 12, 1989, Pat. No. 4,985,581. This application Oct. 24, 1990, Ser. No. 602,589

Claims priority, application Japan, Apr. 26, 1988, 63-101401

Int. Cl.[5] B01J *21/02, 23/22, 23/26, 23/28*

U.S. Cl. 502—206 **1 Claim**

1. A catalyst for use in the ammoxidation of alkyl-substituted aromatic compounds to aromatic nitriles which comprises a vanadium oxide, a chromium oxide, a molybdenum oxide and a boron oxide supported on a silica carrier, wherein the atomic ratio of vanadium:chromium:molybdenum:boron is 1:0.5–2.0:0.01–1.2 :0.01–1.2, and wherein the amount of vanadium oxide, chromium oxide, molybdenum oxide and boron oxide in the catalyst is 20–80% by weight.

5,070,060

PHOSPHOROUS/VANADIUM OXIDATION CATALYST

Bruno J. Barone, Houston, Tex., assignor to Scientific Design Company, Inc., Little Ferry, N.J.

Filed May 21, 1990, Ser. No. 526,457

Int. Cl.[5] B01J *27/198;* **C07D** *307/60*

U.S. Cl. 502—209 **16 Claims**

1. A phosphorus/vanadium/zinc/lithium mixed oxide oxidation catalyst containing from 0.005 to 0.025 moles of molybdenum per mole of vanadium prepared by the process comprising:

admixing a +5 valence vanadium compound with an alcohol, contacting said mixture with gaseous HCl until the valence of vanadium is reduced to less than +5 at a temperature in the range of 35° to 60° C., digesting said reduced vanadium, a zinc compound and a lithium com-

pound in concentrated phosphoric acid of about 98 to 101% H_3PO_4,

adding a molybdenum compound in the mole ratio of Mo/V of 0.005 to 0.025:1 during said digesting,

removing a portion of said alcohol from said digested mixture to form a slurry of mixed oxides and alcohol, and

recovering a dried mixed oxide composition and heating said dried mixed oxide composition at a temperature in the range of 200° to 350° C. for a sufficient period to improve the catalytic properties of the composition.

5,070,061

HETEROPOLYMOLYBDATE CATALYSTS AND METHOD FOR OXYDEHYDROGENATION

Klaus Langerbeins, Mannheim, Fed. Rep. of Germany, assignor to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 390,487, Aug. 1, 1989, abandoned, which is a continuation of Ser. No. 78,223, Jul. 27, 1987, abandoned. This application Dec. 7, 1990, Ser. No. 625,649

Claims priority, application Fed. Rep. of Germany, Aug. 2, 1986, 3626256

Int. Cl.[5] B01J *27/186*

U.S. Cl. 502—211 **9 Claims**

1. A composite heteropolymolybdate catalyst, adaptable to the oxydehydrogenation of isobutyric acid or a lower ester thereof to methacrylic acid or a lower ester thereof, respectively, said composite catalyst being a mixture having the formula, for the composite of

$$H_aM_bP_cMo_dV_eO_f$$

wherein M is at least one member selected from the group consisting of Li, Na, K, Rb, Cs, Be, Mg, Ca, Sr, Ba, Zn, Cd, Al, Ce, Ti, Zr, Sn, Sb, Pb, Bi, Cr, Mn, Fe, Co, Ni, Cu, Ag, and As, a is greater than 0.1 but less than 6, b is 0 to 3, c is 0.5 to 1.5, d is greater than 9 but less than 12, e is 0.1 to 3, and f has a value determined by the valences and amounts of the elements other than oxygen, and consisting essentially of

(A) a mixture of at least two members selected from the group consisting of

(i) $H_{3+x}PMo_{12-x}V_xO_{40}$, wherein x is 1, 2, or 3 and

(ii) metals salts thereof,

the molar ratio of any member or combination of members to any other member in such a mixture being from 0.99:0.001 to 0.001:0.99, or consisting essentially of

(B) a mixture of at least one member selected from the group consisting of said mixture (A)(i) and (A)(ii) and at least one member selected from the group consisting of

(iii) $H_3PMo_{12}O_{40}$ and

(iv) metal salts thereof,

the molar ratio of said member (A)(i) and (A)(ii) to said member or members (B)(iii) and (B)(iv) being from 0.9:01 to 0.1:0.9.

5,070,062

OXYCHLORINATION CATALYST, THE METHOD FOR ITS PREPARATION

Roberto Canavesi, and Ferdinando Ligorati, both of Milan, Italy, assignors to Enichem Synthesis S.p.A., Palermo, Italy

Continuation of Ser. No. 152,138, Feb. 4, 1988, abandoned. This application Feb. 1, 1990, Ser. No. 474,212

Claims priority, application Italy, Feb. 13, 1987, 19369 A/87

Int. Cl.[5] B01J *27/122*

U.S. Cl. 502—225 **6 Claims**

1. An oxychlorination catalyst which consists essentially of microspheroidal alumina particles impregnated with cupric chloride and with at least one metal chloride which is either calcium chloride alone or the combination of calcium chloride and lithium chloride content is from 3 to 7% by weight, expressed in terms of the copper metal, and the metal chloride content is from 0.01 to 4.0% by weight, expressed in terms of the alkali and alkaline-earth metal, and wherein the copper and the at least one metal chloride is distributed uniformly over the entire surface of said alumina particles with a degree of non-uniformity of not more than ±7%.

5. A process for preparing an oxychlorination catalyst consisting essentially of the following steps, carried out in succession:

a) heating porous microspheroidal alumina particles to 250°–500° C. for 1–5 hours;

b) fluidizing the heated particles to form a fluid bed by a flow of fluidizing gas kept at a temperature no higher than 50° C.;

c) impregnating the particles in the fluid bed with a volume of from 0.7 to 0.8 times the total pore volume of the particles, of an aqueous solution of cupric chloride and at least one metal chloride which is either calcium chloride alone or the combination of calcium chloride and lithium chloride;

d) heating the fluidizing gas with a temperature gradient of from 5° to 30° C./hour up to a temperature of approximately 140° C. and maintaining this temperature for a period of from 0.5 to 15 hours; and

e) activating the impregnated particles in said fluid bed with oxygen, or a gas containing oxygen, at a temperature of from 150° to 250° C., for a period of from 4 to 24 hours.

5,070,063

CATALYST

Eric Shutt, Benson, United Kingdom, assignor to Johnson Matthey Public Limited Company, United Kingdom

Continuation of Ser. No. 361,372, Jun. 5, 1989, abandoned. This application Apr. 10, 1991, Ser. No. 683,573

Claims priority, application United Kingdom, Jun. 15, 1988, 8814229

Int. Cl.[5] B01J *27/13*

U.S. Cl. 502—230 **9 Claims**

1. In a Fischer-Tropsch synthesis catalyst having a first component of ruthenium supported on a second component which is a high surface area catalyst support of gamma-alumina the improvement comprising the use of a third and promoting component of bromine moieties and of the first component being in the form of metallic ruthenium.

5,070,064

CATALYST PRETREATMENT METHOD

Edward C. Hsu, Bridgewater, and John L. Robbins, Stockton, both of N.J., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Aug. 7, 1989, Ser. No. 389,916

Int. Cl.[5] B01J *21/06, 23/70*; C07C *1/04*; B03B *5/30*

U.S. Cl. 502—325 **10 Claims**

1. A liquid phase method for removing sub-1 micron particles adhering to catalyst particles the catalyst containing a Group VIII metal supported on an inorganic refractory oxide as a result of preparation of the catalyst which comprises:

(a) dispersing the catalyst particles to which the sub-1 micron particles adhere within a liquid comprising a Fischer-Tropsch;

(b) agitating the dispersion and separating the sub-1 micron particles from the catalyst particles, and concentrating the sub-1 micron particles in the liquid phase; and

(c) separating the sub-1 micron containing liquid phase from the particulate material.

5,070,065

COMPOSITIONS INVOLVING V_2O_3-AL_2O_3-CAO

Arnulf Muan, Lacey Spring, Va., and Mitri S. Najjar, Wappingers Falls, N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Aug. 6, 1990, Ser. No. 563,586

Int. Cl.[5] B01J *21/04*

U.S. Cl. 502—341 **18 Claims**

1. A composition produced from V_2O_3, Al_2O_3 and CaO wherein said composition falls within polygon DEFGH as shown in the disclosed FIG.; wherein the amounts of V_2O_3,

Al_2O_3 and CaO are characterized as shown in the table below;

Vertices	Coordinates (wt %)		
	V_2O_3	Al_2O_3	CaO
D	37	1	62
E	15	23	62
F	15	48	37
G	51	48	1
H	98	1	1.

5,070,066

PRESSURE SENSITIVE REPRODUCING MATERIAL

Zenshiro Iijima, Abiko, Japan, assignor to Adger Kogyo Co., Ltd., Soka, Japan

Continuation of Ser. No. 103,693, Oct. 2, 1987, abandoned. This application May 16, 1989, Ser. No. 352,612
Claims priority, application Japan, Oct. 8, 1986, 61-240070
Int. Cl.[5] B41M 5/14
U.S. Cl. 503—201 3 Claims

1. A method of drawing erasable letters and/or patterns on a piece of cloth or paper comprising the following steps:

1) placing the piece of cloth or paper underneath a pressure sensitive reproducing material composed of a substrate and a colored material supported on said substrate wherein the colored material includes a) a phthalein group indicator b) an inorganic weakly basic substance and an organic amine and c) a hygroscopic material or a drying inhibitor, said phthalein group indicator being color-developed by said inorganic weakly basic substance and said organic amine; and

2) applying a pressure with a pressure applying tool on the surface of the pressure sensitive reproducing material at desired places.

5,070,067

HEAT-SENSITIVE RECORDING MATERIAL

Hisashi Tani, and Hisanori Yagi, both of Hyogo, Japan, assignors to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

Filed Aug. 18, 1989, Ser. No. 395,789
Claims priority, application Japan, Aug. 22, 1988, 63-208757
The portion of the term of this patent subsequent to Jun. 11, 2008, has been disclaimed.
Int. Cl.[5] B41M 5/30
U.S. Cl. 503—219 3 Claims

1. A heat-sensitive recording material comprising a support and a recording layer provided on the support, said recording layer containing a colorless or pale-colored basic dye and a color developer capable of forming a color upon application of heat, wherein a hectorite clay is incorporated in at least one of layers constituting the recording material.

5,070,068

HEAT TRANSFER SHEET

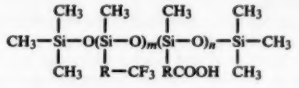
Nobuhisa Nishitani, Shinjuku, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Continuation of Ser. No. 305,173, Feb. 2, 1989, Pat. No. 4,968,659. This application Aug. 21, 1990, Ser. No. 570,553
Claims priority, application Japan, Feb. 5, 1988, 63-23760
The portion of the term of this patent subsequent to Nov. 6, 2007, has been disclaimed.
Int. Cl.[5] B41M 5/035, 5/26
U.S. Cl. 503—227 6 Claims

1. A heat transfer sheet comprising:

a substrate film; and

a dye layer formed on said substrate film, said dye layer comprising a dye, a binder, and a dye-permeative release agent comprising a flourine fatty acid modified silicone having the following formula (I):



(I)

wherein M=5 to 300, n=5 to 300, and R=alkylene group having 1 to 30 carbon atoms.

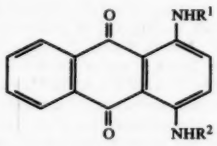
5,070,069

THERMAL TRANSFER PRINTING

Roy Bradbury, St. Helens; Peter A. Gemmell, Bentley, and Richard A. Hann, Ipswich, all of England, assignors to Imperial Chemical Industries plc, London, England

Filed Sep. 29, 1989, Ser. No. 414,524
Claims priority, application United Kingdom, Oct. 5, 1988, 8823386
Int. Cl.[5] B41M 5/035, 5/26
U.S. Cl. 503—227 20 Claims

1. A thermal transfer printing sheet comprising a substrate having a coating comprising a binder, one or more anthraquinone dyes of Formula I:

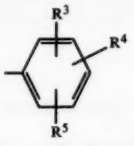


I

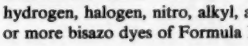
wherein

R^1 represents alkyl, alkenyl, cycloalkyl, haloalkyl, cyanoalkyl, alkoxyalkyl, alkoxyalkoxyalky, hydroxyalkyl, hydroxyalkoxyalkyl, hydroxyalkylthioalkyl, tetrahydrofurfuryl, alkenyloxyalkyl, tetrahydrofurfuryloxyalkyl, alkoxycarbonylalkyl, alkoxycarbonyloxyalkyl or alkoxycarbonyloxyalkyl, and

R^2 represents any of the substituents represented by R^1 or a radical of the formula:



wherein each of R^3, R^4 and R^5, independently, represents hydrogen, halogen, nitro, alkyl, alkenyl or alkoxy, and one or more bisazo dyes of Formula II:



II

wherein:

A is the residue of a diazotisable phenylamine or naphthylamine, A—NH_2, carrying not more than one unsaturated electron-withdrawing group;

B is an optionally substituted thiophen-2,5-ylene group; and

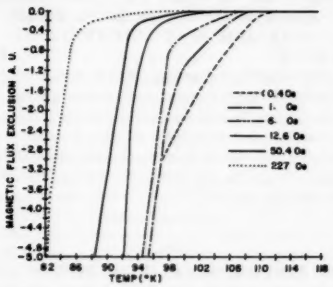
E is the residue of an aromatic coupling component E-X wherein X is an atom or group displaceable by a diazotised aromatic amine.

5,070,070

HIGH TEMPERATURE SUPERCONDUCTING MEMORY STORAGE DEVICE AND CRYOTRON

Thomas R. Askew; Richard B. Flippen, both of Wilmington, and Munirpallam A. Subramanian, New Castle, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 9, 1988, Ser. No. 165,683
Int. Cl.[5] H01L *39/12, 39/18;* G11C *11/44*
U.S. Cl. 505—1 4 Claims



1. A binary memory storage device comprising a crystal of a compound having the formula

$$Bi_2Sr_{3-z}Ca_zCu_2O_{8+w}$$

wherein z is from about 0.4 to about 0.8 and $o<w<l$, means for cooling said crystal to a temperature between about 77K and about 96K, means for applying and removing a dc magnetic field of about 10 Oe (800 A/m) to about 200 Oe to said crystal, means for applying an alternating magnetic field having a maximum strength of about 1 Oe to said crystal, and means for detecting the amount of flux excluded by said crystal.

5,070,071

METHOD OF FORMING A CERAMIC SUPERCONDUCTING COMPOSITE WIRE USING A MOLTEN POOL

Theodore H. Geballe, Woodside; Robert S. Feigelson, Saratoga, and Dan Gazit, Palo Alto, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Filed Oct. 11, 1988, Ser. No. 255,792
Int. Cl.[5] B05D *5/12, 1/18*
U.S. Cl. 505—1 6 Claims

1. A method for making a flexible superconductive composite wire comprising the steps of:

(a) drawing a wire of noble metal through a molten material, formed by melting a solid formed by pressing powdered Bi_2O_3, $CaCO_3$, $SrCO_3$ and CuO in a ratio of components necessary for forming a Bi-Sr-Ca-Cu-O superconductor, into said solid and sintering at a temperature in the range of 750°–800° C. for 10–20 hours, whereby said wire is coated by said molten material; and

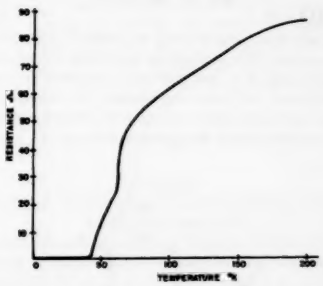
(b) cooling said coated wire to solidify said molten material to form said superconductive flexible composite wire without need of further annealing.

5,070,072

CONDUCTIVE ARTICLES AND PROCESSES FOR THEIR PREPARATION

Jose M. Mir, Webster; John A. Agostinelli, Rochester; David L. Peterson, Penfield; Gustavo R. Paz-Pujalt, Rochester; Brian J. Higberg, Pittsford, and Gopalan Rajeswaran, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 46,593, May 4, 1987, Pat. No. 4,880,776.
This application Mar. 27, 1989, Ser. No. 329,049
Int. Cl.[5] B32B *9/00*
U.S. Cl. 505—1 47 Claims



1. An article comprised of a substrate and an electrically conductive layer located on the substrate characterized in that the electrically conductive layer is comprised of greater than 45 percent by volume of a crystalline rare earth alkaline earth copper oxide exhibiting a ratio of metals satisfying (Ia) or (IIa)

$$L_{2-x}:M_x:C:O_y \quad \text{(Ia)}$$

$$Y_1:A_2:C_3:O_z \quad \text{(IIa)}$$

and the substrate is comprised of alumina, where

A is alkaline earth;

C is copper;

L is lanthanide;

M is alkaline earth;

Y is yttrium;

x is 0.05 to 0.30;

y is the amount of oxygen that results from

(a) heating an amorphoux mixture of oxides of L, M and C satisfying the ratio

$$L_{2-x}:M_x:C \quad \text{(I)}$$

in the form of a coating having a thickness of 1 μm or less on the substrate to a temperature in the range of from 925° to 975° C. to form a crystalline phase,

(b) effecting crystal growth by heating in the temperature range of from 975° to 1050° C., and

(c) cooling the coating in the presence of oxygen at a rate of less than 25° C. per minute until it reaches a temperature of from 550° to 450° C.; and

z is the amount of oxygen that results from

(a) heating an amorphous mixture of oxides of Y, A and C satisfying the ratio

$$Y_1:A_2:C_3 \quad \text{(II)}$$

in the form of a coating having a thickness of 1 μm or less on the substrate to a temperature in the range of from 900° to 950° C. to form a crystalline phase and

(b) cooling the coating in the presence of oxygen at a rate of less than 25° C. per minute until it reaches a temperature of from 750° to 400° C.

5,070,073

SUBSTITUTED CYCLOPENTENYL-OXABICYCLOOCTANES, CYCLOPENTENYL-FORMYLCYCLOHEXENES AND CYCLOPENTENYL-HYDROXYMETHYL CYCLOHEXENES, PROCESSES FOR PREPARING SAME AND ORGANOLEPTIC USES THEREOF

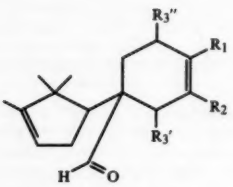
Anubhav P. S. Narula, Hazlet; John J. De Virgilio, Freehold, both of N.J.; Carlos Benaim, Bedford Hills, N.Y.; Anton V. Ouwerkerk, Livingston, and Olivier Gillotin, Denville, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

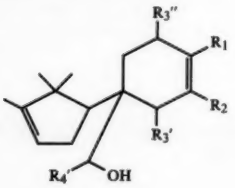
Division of Ser. No. 588,825, Sep. 27, 1990. This application Apr. 11, 1991, Ser. No. 684,069

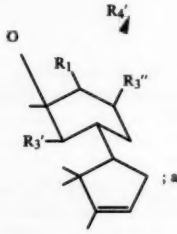
Int. Cl.[5] A61K *7/46*

U.S. Cl. 512—13 **13 Claims**

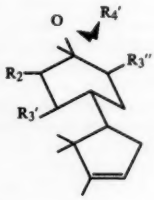
1. A process for augmenting or enhancing the aroma of a perfume composition, cologne or perfumed article comprising the step of adding to said perfume composition, cologne or perfumed article, an aroma augmenting or enhancing quantity of at least one substituted cyclopentene defined according to a structure selected from the group consisting of:

(i) 

(ii) 

(iii) 

; and

(iv) 

wherein R_1, R_2, R_3', and R_3'' each represents hydrogen or methyl with the provisos:

(i) one or two of R_1, R_2, R_3' and R_3'' is methyl;

(ii) R_1 and/or R_2 represents methyl;

(iii) at least one or R_3' and R_3'' is hydrogen; and

(iv) when R_1 and R_2 is methyl then R_3' and R_3'' represents hydrogen

and wherein R_4' is hydrogen or C_1–C_5 alkyl.

5,070,074

HYPOGLYCEMIC AND GROWTH-PROMOTING POLYPEPTIDES ISOLATED FROM BACITRACIN

Victor Medina, Bayside; Alfred Stracher, Roslyn Estates, and Leo Kesner, Brooklyn, all of N.Y., assignors to Protor Co., Garden City, N.Y.

Continuation of Ser. No. 83,557, Aug. 7, 1987, abandoned. This application Jul. 23, 1990, Ser. No. 559,445

Int. Cl.[5] A61K *37/02, 37/26;* **C07C** *103/52*

U.S. Cl. 514—3 **10 Claims**

2. A composition comprising insulin and a polypepetide fraction isolated from bacitracin and, on a weight basis, exhibiting at least 5 times the anti-insulinase activity of the bacitracin, the fraction having a molecular weight of about 1400, being obtainable by adsorption from bacitracin on CM-Sepharose and subsequent elution and being substantially free of A and F bacitracin components.

5,070,075

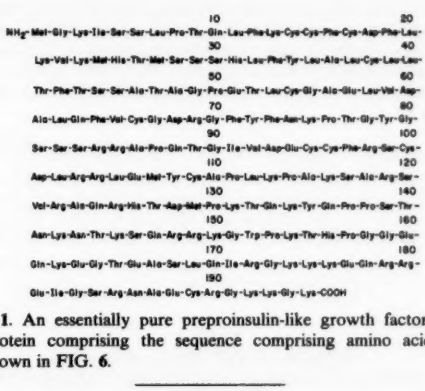
HUMAN PREPROINSULIN-LIKE GROWTH FACTOR I

Peter S. Rotwein, St. Louis, and Gwen G. Krivi, Olivette, both of Mo., assignors to Washington University, St. Louis, Mo.

Division of Ser. No. 929,671, Nov. 20, 1986, Pat. No. 4,963,665, which is a continuation-in-part of Ser. No. 816,662, Jan. 7, 1986, abandoned. This application Mar. 15, 1990, Ser. No. 494,050

Int. Cl.[5] C07K *7/10, 7/40;* **A61K** *37/24*

U.S. Cl. 514—12 **2 Claims**



1. An essentially pure preproinsulin-like growth factor-I protein comprising the sequence comprising amino acids shown in FIG. 6.

5,070,076

THYMUS-GLAND PREPARATION AND METHOD FOR PRODUCING SAME

Vyacheslav G. Morozov, and Vladimir K. Khavinson, both of Leningrad, U.S.S.R., assignors to Leningradsky Gosudarstvenny Pedagogichesky Institut, Moscow, U.S.S.R.

Continuation of Ser. No. 117,675, Nov. 5, 1987, abandoned, which is a continuation-in-part of Ser. No. 777,006, Sep. 17, 1985, abandoned, which is a continuation of Ser. No. 618,958, Jun. 11, 1984, abandoned. This application Nov. 15, 1989, Ser. No. 437,283

Int. Cl.[5] A61K *37/02;* **C07K** *15/06, 3/02*

U.S. Cl. 514—21 **14 Claims**

1. A method for producing a thymus-gland preparation containing polypeptides with a molecular weight of 600 to 6,000 Dt having the following composition:

80–90 percent by weight of polypeptides with an isoelectric point of 3.5–6.7; and

20–10 percent by weight of polypeptides with an isoelectric

point of 7–9 and molecular weight of 4,000–6,000 Dt, said method comprising:

homogenizing thymus tissue;

extracting the resulting homogenizate with a 1–10% aqueous solution of acetic acid in the presence of zinc chloride, said zinc chloride being present in an amount of 0.2–2 g per liter of said solution of acetic acid;

separating the resulting extract into a precipitate and supernatant liquid;

treating the supernatant liquid with an organic solvent to form a precipitate; and

recovering said thymus-gland preparation.

5,070,077

METHOD OF TREATMENT OF HEPATITIS

Jay H. Hoofnagle, Rockville; Samuel Broder, Bethesda; Hiroaki Mitsuya, Rockville, and Robert Yarchoan, Bethesda, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 84,055, Aug. 11, 1987, Pat. No. 4,861,759, which is a continuation-in-part of Ser. No. 937,925, Dec. 4, 1986, abandoned, which is a continuation-in-part of Ser. No. 769,016, Aug. 26, 1985, abandoned. This application May 15, 1989, Ser. No. 351,502

Int. Cl.[5] A61K *31/70*

U.S. Cl. 514—45 **14 Claims**

1. A method for treating hepatitis B comprising administering to a patient infected with hepatitis B an anti-hepatitis B effective amount of a nucleoside selected from the group consisting of 2',3'-dideoxyinosine 2',3'-dideoxyadenosine, and 2',3'-dideoxyguanosine.

5,070,078

ANTIVIRAL COMPOUNDS

John W. T. Selway, Beckenham, England; Lowrie M. Beacham, III, Durham, N.C.; Susan M. Daluge, Chapel Hill, N.C.; Joel Van Tuttle, Durham, N.C., and Thomas A. Krenitsky, Chapel Hill, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Aug. 19, 1988, Ser. No. 234,215

Claims priority, application United Kingdom, Aug. 22, 1987, 8719877

Int. Cl.[5] A61K *31/00*; **C07H** *19/00*

U.S. Cl. 514—50 **7 Claims**

1. A formulation in a form for ophthalmic administration comprising the compound 5-chloro-1-(2,3-dideoxy-3-fluoro-β-D-erythro-pentofuranosyl) uracil and a pharmaceutically acceptable carrier therefor.

5,070,079

PHARMACEUTICAL COMPOSITIONS CONTAINING CYTIDINE MONOPHOSPHATE OF 5-ACETAMIDO-3-, 5-D-DEOXY-D-GLYCERO-D-GALACTO-NONULOSAMIC ACID

Pietro Miccoli, Triest, and Enio Decorté , Aiello del Friuli, both of Italy, assignors to CRC-Compagnia di Ricerca Chimica S.p.A., S. Giovanni al Natisone, Italy

Division of Ser. No. 228,828, Aug. 3, 1988, abandoned, which is a continuation of Ser. No. 73,751, Jul. 10, 1987, abandoned, which is a division of Ser. No. 584,805, Feb. 29, 1984, Pat. No. 4,704,361. This application Jul. 23, 1990, Ser. No. 560,239

Claims priority, application Italy, Mar. 1, 1983, 83341 A/83; Apr. 20, 1983, 83371 A/83

Int. Cl.[5] A61K *31/70*

U.S. Cl. 514—51 **2 Claims**

1. Method for treatment of patients having lesions of the peripheral or central nervous system, comprising administration to said patients of a therapeutically effective amount of CMP-NANA or a pharmaceutically acceptable composition thereof.

5,070,080

METHOD OF INHIBITING GENERATION, MATURATION, MOTILITY AND VIABILITY OF SPERM WITH MINERALS IN BIOAVAILABLE FORM

Mostafa S. Fahim, 500 Hulen Dr., Columbia, Mo. 65203

Continuation-in-part of Ser. No. 230,582, Aug. 10, 1988, Pat. No. 4,937,234. This application Jan. 30, 1989, Ser. No. 303,747

Int. Cl.[5] A61K *31/715, 31/415, 31/315, 31/195*

U.S. Cl. 514—53 **15 Claims**

1. A method of inhibiting generation, maturation, motility or viability of sperm in a reproductive tract of an animal comprising applying in said reproductive tract an aqueous solution of a mineral gluconate salt and an amino acid capable of forming the solution, said aqueous solution neutralized to a pH in the range of 6.0 to 7.5 and applied in an amount effective to inhibit generation, maturation, motility or viability of sperm in the reproductive tract and said mineral gluconate salt and said amino acid being present in substantially equal molar amounts at a concentration in the range from about 0.05 M to about 2.0 M.

5,070,081

INCLUSION COMPLEXES OF CYCLODEXTRINS BY AGGLOMERATION

Abdul Majid, Ottawa, and John A. Ripmeester, Gloucester, both of Canada, assignors to National Research Council of Canada, Ottawa, Canada

Filed Apr. 14, 1989, Ser. No. 337,969

Claims priority, application Canada, Apr. 20, 1988, 564609

Int. Cl.[5] A61K *9/62, 31/70*; **B01J** *13/02*

U.S. Cl. 514—58 **12 Claims**

1. A process for preparing inclusion complexes of guest molecules and cyclodextrins, in agglomerate form, comprising:

a) contacting the cyclodextrin in solid particulate form with a selected guest molecule material in the presence of a small amount of water only sufficient to serve as agglomeration binding liquid, to form a mixture,

b) agitating the mixture sufficiently to cause interpenetration of the components and inclusion complex formation to occur,

c) continuing agitation until agglomerates form,

and d) recovering agglomerates of the inclusion complexes.

5,070,082

SOLUBILIZED PRO-DRUGS

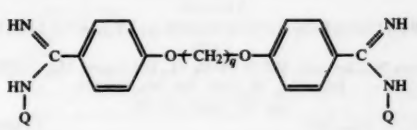
Keith C. Murdock, Pearl River, and Ving J. Lee, Monsey, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 330,000, Mar. 31, 1989, abandoned, which is a continuation-in-part of Ser. No. 184,998, Apr. 22, 1988, abandoned, which is a continuation-in-part of Ser. No. 91,077, Aug. 31, 1987, abandoned, which is a continuation-in-part of Ser. No. 922,220, Oct. 23, 1986, abandoned. This application Mar. 18, 1991, Ser. No. 671,051

Int. Cl.[5] A61K *31/665, 31/66*; **C07F** *9/6574, 9/24*

U.S. Cl. 514—105 **7 Claims**

1. A compound of the formula

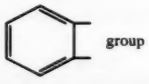


wherein

q is an integer from 1 to 7, Q is hydrogen or A, wherein A is

such that R′ and R″ may be the same or different and (where R is C_1–C_6 alkyl, C_6H_5—, C_6H_5—CH_2—, NC—CH_2CH_2—,

Cl_3C—CH_2— or $R_7OCH_2CH_2$—, where R_7 is hydrogen or C_1–C_6 alkyl), hydrogen, or a pharmaceutically acceptable cation or R′ and R″ are linked to form a —CH_2—CH_2 or a



group

provided that at least one Q is A.

5,070,083

FUNGICIDAL ALUMINUM TRIS-ALKYL-PHOSPHONATE COMPOSITION

Denis Barlet, Lyons, France, assignor to Rhone Poulenc Agrochimie, S.A., Lyons, France

Division of Ser. No. 891,547, Jul. 29, 1986, Pat. No. 4,935,410, which is a continuation-in-part of Ser. No. 770,653, Aug. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 870,983, Jun. 5, 1986, abandoned, which is a continuation of Ser. No. 684,987, Dec. 21, 1984, abandoned, which is a continuation of Ser. No. 595,460, Mar. 30, 1984, abandoned. This application Jan. 24, 1990, Ser. No. 469,302

Claims priority, application France, Mar. 31, 1983, 83 05562; Aug. 29, 1984, 84 13557

Int. Cl.[5] **A01N** *57/10, 57/00;* **A61K** *31/66;* **C07F** *9/02*

U.S. Cl. 514—144 **7 Claims**

1. A stabilized fungicidal composition against phytophagous and phytophthora fungal infection in plants consisting of an aqueous solution of:

(a) about 1 g to 120 g per liter of solution of aluminum tris-ethyl-phosphonate; and

(b) 0.3 to 0.8 of the stoichiometric amount per mole of aluminum tris-ethyl-phosphonate, of a stabilized salt selected from the group consisting of calcium acetate and zinc acetate.

5,070,084

TREATMENT OF SYMPATHETICALLY MAINTAINED PAIN

James N. Campbell, 600 N. Wolfe St., Baltimore, Md. 21205

Filed Feb. 26, 1990, Ser. No. 485,156

Int. Cl.[5] **A61K** *31/495*

U.S. Cl. 514—248 **3 Claims**

1. A method of treatment of sympathetically maintained pain comprising administering to a patient at a painful site an effective amount of an α-adrenergic antagonist to cause measurable pain relief.

5,070,085

COMPOSITIONS AND METHODS FOR ADMINISTERING THERAPEUTICALLY ACTIVE COMPOUNDS

Richard G. Markham, Prescott, Ariz., assignor to Oxycal Laboratories, Inc., Prescott, Ariz.

Continuation-in-part of Ser. No. 246,504, Sep. 19, 1988, Pat. No. 4,968,716, which is a continuation-in-part of Ser. No. 36,598, Apr. 10, 1987, Pat. No. 4,822,816.

PCT No.: PCT/US89/04046, § 371 Date: Apr. 6, 1990, § 102(e) Date: Apr. 6, 1990

PCT Filed Sep. 15, 1989, Ser. No. 459,806

The portion of the term of this patent subsequent to Apr. 18, 2006, has been disclaimed.

Int. Cl.[5] **A61K** *31/62, 31/60, 31/34, 47/00*

U.S. Cl. 514—161 **19 Claims**

1. A therapeutic composition, said composition comprising:

(a) an effective amount of a therapeutically active compound, said compound having

(i) a molecular weight below about 5,000,

(ii) an acidic functional group and a pKa of ≦6 at physiological pH=7.4, and

(iii) which is normally eliminated unmetabolized via the renal tubular secretion pathway for organic anions; and

(b) at least one compound selected from the group consisting of L-threonic, L-xylonic and L-lyxonic acids, and the edible non-toxic salts, aldono-lactones and aldono-lactides thereof, in an amount effective to increase the body absorption rate of said active compound.

5,070,086

IMIDAZO- AND PYRIMIDO-QUINOLINE, NAPHTHYRIDINE AND PYRIDOPYRAZINE COMPOUNDS

Richard Friary, West Orange, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 137,306, Dec. 23, 1987, abandoned.

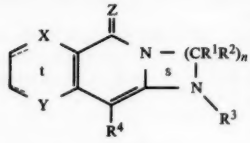
PCT No.: PCT/US88/04527, § 371 Date: Jun. 15, 1990, § 102(e) Date: Jun. 15, 1990

PCT Filed Dec. 21, 1988, Ser. No. 499,473

Int. Cl.[5] **C07D** *471/14, 239/00, 221/00;* **A61K** *31/00*

U.S. Cl. 514—183 **10 Claims**

1. A compound having the structural formula I



or a pharmaceutically acceptable salt or solvate thereof, wherein:

the dotted lines ---- in ring t either both represent double bonds or such double bonds are absent;

X represents CH_2 or NR^3 if the dotted line attached thereto does not represent a double bond or CH or N if the dotted line attached thereto represents a double bond;

Y represents NR^3 if the dotted line attached thereto does not represent a double bond or N if the dotted line attached thereto represents a double bond;

Z represents O, S or NR^5;

n represents an integer 2, 3, 4, or 5;

R^1 and R^2 may be the same or different and each R^1 and each R^2 independently represents H or alkyl or two R^1 and R^2 groups on the same or different carbon atoms may together represent a carbocyclic ring having from 5 to 8 carbon atoms;

each R^3 independently represents H, alkyl, aralkyl, heteroarylalkyl, acyl, aroyl or heteroaroyl;

R^4 represents H, alkyl, aryl, aralkyl or heteroaryl; and

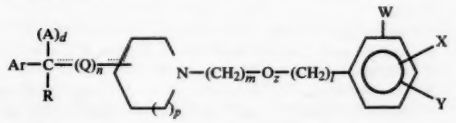
R^5 represents H, alkyl, aryl, heteroaryl, aralkyl, heteroarylalkyl, acyl, aroyl, or heteroaroyl;
wherein alkyl represents straight or branched C_1–C_6 carbon chains;
aryl represents a carbocyclic group containing from 6 to 15 carbon atoms and having at least one benzene ring;
heteroaryl represents cyclic groups having at least one O, S and/or N interrupting a carbocyclic ring structure;
acyl represents alkyl—CO—;
aroyl represents aryl—CO; and
heteroaroyl represents heteroaryl—CO.

5,070,087
ARYL(ALKYLAND ALKYLENE)-N-((PHENOXY AND PHENYLTHIO)ALKYL) AMINOHETEROCYCLICS AS CARDIOVASCULAR, ANTIHISTAMINIC, ANTISECRETORY AND ANTIALLERGY AGENTS

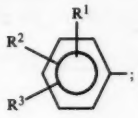
Lina C. Teng; David A. Walsh, and James R. Shanklin, Jr., all of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Filed May 8, 1989, Ser. No. 349,247
The portion of the term of this patent subsequent to Mar. 7, 2006, has been disclaimed.
Int. Cl.[5] A61K *31/445, 31/40, 31/55*
U.S. Cl. 514—212 **5 Claims**

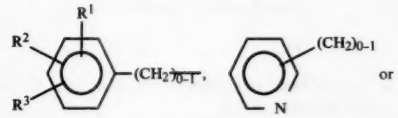
1. A method for treating type 1 allergic responses in a mammal, by administering an effective amount of a compound having the formula:



wherein,
Ar is



R is



cycloalkyl-$(CH_2)_{0-1}$—;

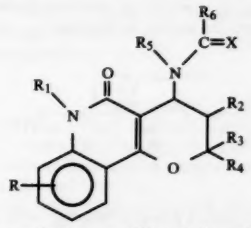
A is hydrogen, hydroxy, cyano, $C(O)NR^4R^5$ or $—NR^4R^5$,
Q is $—CH_2—$, —CH— or —CHOH—;
d and n, same or different, are zero or one, and the dotted lines represent double bonds which may form consistent with the valence of carbon;
p is zero one or two;
m is zero to six inclusive;
l is zero or one;
W is hydrogen, loweralkyl, halo, nitro, loweralkoxy or hydroxy;
X is hydrogen, loweralkyl, halo, loweralkoxy or hydroxy;
Y is —CH(OH)CH_2OH, —CH(OH)C(O)OH, —C(O)C(O)OH, —C(O)CH_2OH, —C(O)C(O)OCH_3, —C(O)C(O)OC_2H_5, —CH_2C(O)OC_2H_5, —CH(OH)C(O)OCH_3, —CH(OH)C(O)OC_2H_5, or —C(O)CH_2OC(O)CH_3;
R^1, R^2 and R^3, same or different, are hydrogen, loweralkyl, halo, nitro, trifluoromethyl, cyano, loweralkoxy or hydroxy;
R^4 and R^5, same or different, are hydrogen, loweralkyl, phenyl, or phenylloweralkyl;
and the pharmaceutically acceptable salts thereof.

5,070,088
PYRANYL QUINOLINE CALCIUM CHANNEL BLOCKERS

Karnail Atwal, Newtown, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

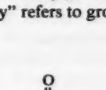
Filed Dec. 19, 1989, Ser. No. 452,999
Int. Cl.[5] C07D *491/052;* **A61K** *31/44, 31/47*
U.S. Cl. 514—212 **20 Claims**

1. A compound having the formula



I

or a pharmaceutically acceptable salt thereof, wherein
X is oxygen or sulfur;
R is hydrogen, alkyl, alkenyl, alkynyl, aryl, arylalkyl, haloalkyl, cycloalkyl, (cycloalkyl)alkyl, $—NO_2$, —CN, $—CF_3$, alkoxy or halo;
R_1 is hydrogen, alkyl, alkenyl, alkynyl, aryl, arylalkyl, haloalkyl, cycloalkyl, (cycloalkyl)alkyl;
R_2 is hydrogen, hydroxy, $—OCOR_1$, where R_1 is not hydrogen;
R_3 and R_4 are independently hydrogen, alkyl, or arylalkyl;
R_5 is R_1;
R_6 is R_1, amino, substituted amino or $—OR_1$, where R_1 is not hydrogen, or R_5 and R_6 taken together with the nitrogen and carbon atoms to which they are attached form a 5-, 6- or 7-membered saturated ring;
wherein the terms "alkyl" and "alkoxy" refers to both straight and branched chain groups having 1 to 10 carbon atoms;
the terms "alkenyl" and "alkynyl" refer to both straight and branched cain groups having 2 to 10 carbon atoms;
the term "aryl" refers to phenyl and monosubstituted phenyl wherein the substitutent may be amino, alkylamino, dialkylamino, nitro, halogen, hydroxyl, trifluoromethyl, difluoromethoxy, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkanoyloxy, cyano, carbonyl, or carboxyl groups;
the term "alkanoyloxy" refers to groups having the formula alkyl



and containing 2 to 11 carbon atoms;
the term "cycloalkyl" refers to groups having 3, 4, 5, 6 or 7 carbon atoms;
the term "halogen" refers to fluorine, chlorine, bromine and iodine;
the term "substituted amino" refers to a group of the formula $—NZ_1Z_2$ wherein Z_1 is hydrogen, alkyl, or aryl-$(CH_2)_m$— and Z_2 is alkyl or aryl-$(CH_2)_m$— (where m is 0 to 2); and
the term "arylalkyl" refers to groups containing aryl and alkyl moieties as defined above.

20. A method for the treatment of ischemia in a mammalian host comprising administering to a mammalian host in need thereof, a therapeutically effective amount of a compound of claim 1.

5,070,089

THERAPEUTIC AGENT FOR LIVER DISEASE AND PIPERAZINE DERIVATIVES

Mitsuo Masaki, Chiba; Tomio Yamakawa, Kashiwa; Masaru Satoh, Koshigaya; Hiromitsu Takeda, Washimiya; Yasushi Yoshino, Narashino, and Hitoshi Matsukura, Kasukabe, all of Japan, assignors to Nippon Chemiphar Co., Ltd., Tokyo, Japan

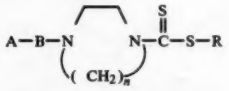
Filed Jan. 26, 1989, Ser. No. 302,552

Claims priority, application Japan, Jan. 26, 1988, 63-13622; Apr. 5, 1988, 63-84459; Apr. 5, 1988, 63-84460; Apr. 5, 1988, 63-84461

Int. Cl.[5] A01N *43/60;* **A61K** *31/495;* **C07D** *241/04*

U.S. Cl. 514—255 **6 Claims**

1. A method of treatment of liver disease in humans comprising administering to a patient an anti-liver disease effective amount of a piperazine having the formula:



wherein

A represents a phenyl group which may have at least one substituent selected from the group consisting of halogen, alkyl fluoroalkyl, formyl, alkoxycarbonyl, acyl, hydroxy, alkoxy, acyloxy, glycosyloxy, amino, alkylamino, mercapto, alkylthio and nitro;

B represents a single bond or a straight chain alkylene group containing 1–4 carbon atoms which may have at least one substituent selected from the group consisting of alkyl, non-heterocyclic aryl, non-heterocyclic aralkyl, hydroxy and oxo;

R represents an atom or a group selected from the group consisting of hydrogen, alkali metal, alkaline earth metal, alkyl, cycloalkyl, non-heterocyclic aralkyl and non-heterocyclic aryl; and

n is 2 or 3,

or it pharmaceutically acceptable salt.

5,070,090

ANTIPICORPAVIRAL HERTEROCYCLIC-SUBSTITUTED MORPHOLINYL ALKYLPHENOL ETHERS

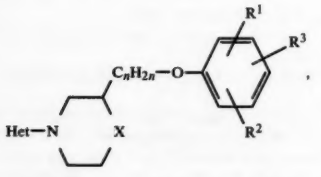
Raymond A. Stokbroekx, Beerse, and Marcel J. M. Van der Aa, Kasterlee, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 351,699, May 15, 1989, abandoned. This application Apr. 25, 1990, Ser. No. 514,635

Int. Cl.[5] C07D *413/02*

U.S. Cl. 514—236.5 **23 Claims**

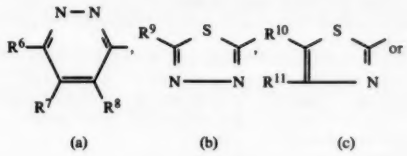
1. A compound of the formula



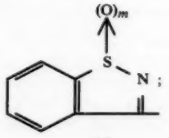
(I)

a pharmaceutically acceptable addition salt thereof or a stereochemically isomeric form thereof, wherein

Het is a heterocycle of formula



(a) (b) (c)



(d)

R^6 is hydrogen, C_{1-4}alkyl, halo, hydroxy, trifluoromethyl, cyano, C_{1-4}alkyloxy, C_{1-4}alkylthio, C_{1-4}alkylsulfinyl, C_{1-4}alkylsulfonyl, C_{1-4}alkyloxycarbonyl, C_{1-4}alkylcarbonyl or aryl;

R^7 and R^8 each independently are hydrogen or C_{1-4}alkyl;

R^9 is hydrogen, halo, amino, C_{1-4}alkyl, trifluoromethyl or aryl;

R^{10} is hydrogen, halo, amino or nitro;

R^{11} is hydrogen, C_{1-4}alkyl, C_{1-4}alkyloxycarbonyl or aryl;

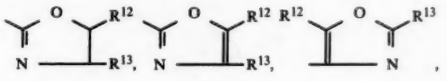
m is 0, 1 or 2;

X is O;

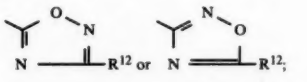
n is an integer of from 1 to 4 inclusive;

R^1 and R^2 each independently are hydrogen, C_{1-4}alkyl or halo; and

R^3 is hydrogen, halo, cyano, C_{1-4}alkyloxy, aryl or —COOR[4] with R^4 being hydrogen, C_{1-4}alkyl, arylC_{1-4}alkyl, C_{3-6}cycloalkylC_{1-4}alkyl, C_{3-5}alkenyl, C_{3-5}alkynyl or C_{1-4}alkyloxyC_{1-4}alkyl; or R^3 is a radical of formula



(e) (f) (g)



(h) (i)

R^{12} and R^{13} each independently are hydrogen, C_{1-4}alkyl, aryl or arylC_{1-4}alkyl;

wherein each aryl is phenyl, optionally substituted with 1 or 2 substituents each independently selected from halo, C_{1-4}alkyl, trifluoromethyl, C_{1-4}alkyloxy or hydroxy.

5,070,091

SUBSTITUTED 1,2,4-TRIAZINEDIONES USEFUL AGAINST PROTOZOA IN INSECTS

Heinz Mehlhorn, Neuss-Udesheim; Günter Schmahl, Bochum; Werner Lindner, Koeln, and Axel Haberkorn, Wupperpal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 28, 1989, Ser. No. 458,040

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1989, 3900374

The portion of the term of this patent subsequent to Jun. 19, 2007, has been disclaimed.

Int. Cl.[5] A01N *43/707;* **A01K** *47/00*

U.S. Cl. 514—242 **7 Claims**

1. A method of combating Protozoa in insects comprising

treating said insects of their habitat with an effective amount to combat Protozoa in insects of at least one substituted 1,2,4-triazinedione of the formula

in which

R^1 represents unsubstituted or substituted aromatic radical or an unsubstituted or substituted heteroaromatic radical which is bonded via carbon,

X represents O, S, SO, SO_2, or

R^2 represents one or more identical or different radicals said radical being hydrogen, halogen, nitro, alkyl, alkoxy, halogenoalkyl or halogenoalkoxy,

R^3 represents hydrogen or unsubstituted or substituted alkyl, alkenyl, alkinyl or aralkyl, and salts of said triazinedione with bases.

5,070,092

PYRROLOINDOLE DERIVATIVES RELATED TO DC-88A COMPOUND

Yutaka Kanda, Houston, Tex.; Youichi Uosaki, Machida, Japan; Hiromitsu Saito, Sagamihara, Japan; Hiroshi Sano, Machida, Japan; Eiji Kobayashi, Shizuoka, Japan; Makoto Morimoto, and Satoru Nagamura, both of Machida, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

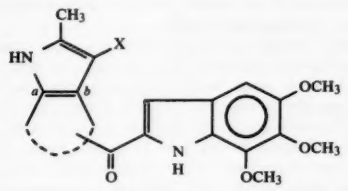
Filed Jun. 29, 1990, Ser. No. 545,579

Claims priority, application Japan, Jul. 3, 1989, 1-171605

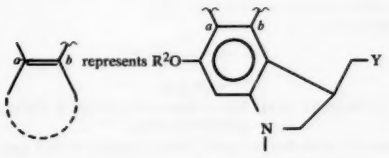
Int. Cl.[5] A61K *31/495, 31/40;* **C07D** *487/04, 487/08*

U.S. Cl. 514—253 **9 Claims**

1. A compound represented by the formula:

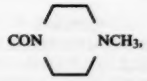


wherein X represents hydrogen or CO_2R^1 (in which R^1 represents hydrogen, a straight-chain or branched alkyl having 1 to 4 carbon atoms, allyl, or benzyl); and



wherein Y represents chlorine or bromine; R^2 represents hydrogen, COR^3 (in which R^3 represents a straight-chain or branched alkyl having 1 to 4 carbon atoms), $CONR^4R^5$ (in which R^4 and R^5 independently represent a straight-chain or branched alkyl having 1 to 4 carbon atoms),

(in which n represents 4 or 5),



CO_2R^6 (in which R^6 represents a straight-chain or branched alkyl having 1 to 4 carbon atoms, or allyl), or $SiR^7R^8R^9$ (in which R^7, R^8 and R^9 independently represent a straightchain or branched alkyl having 1 to 4 carbon atoms); or a pharmaceutically acceptable salt thereof.

5,070,093

TETRACYCLIC AMINES USEFUL AS CEREBROVASCULAR AGENTS

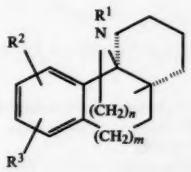
Thomas C. Malone, Canton, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 565,306, Aug. 9, 1990. This application Mar. 28, 1991, Ser. No. 677,029

Int. Cl.[5] C07D *209/56, 223/14, 215/02*

U.S. Cl. 514—284 **8 Claims**

1. A compound of formula



I

or a pharmaceutically acceptable acid addition salt thereof wherein:

R^1 is hydrogen, lower alkyl, lower alkenyl, lower alkynyl, arylloweralkyl, or cyclopropylloweralkyl,

R^2 and R^3 are each independently hydrogen, lower alkyl, hydroxy, lower alkoxy, halogen, amino, monoloweralkylamino or diloweralkylamino;

m is an integer of from 0 to 2; and

n is an integer of from 2 to 4.

7. A method of treating cerebrovascular disorders which comprises administering to a patient a pharmaceutical composition according to claim **1** in unit dosage form.

5,070,094

N-BENZYLTROPANEAMIDES

Kerry W. Fowler, Seattle, Wash., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Sep. 5, 1989, Ser. No. 402,953

Int. Cl.[5] A61K *31/44;* **C07D** *451/02*

U.S. Cl. 514—304 **13 Claims**

1. A compound of the general formula

and the pharmaceutically acceptable salts thereof, wherein R^1 is unsubstituted or substituted aryl, or alkyloxyaryl, in which

alkyl is one to ten carbon atoms and wherein R^2 is cycloalkyl of three to eight carbon atoms, phenyl, phenyl substituted by alkyl of one to ten carbon atoms, fused polycycloalkyl, fused cycloalkyl phenyl, fused cycloalkyl phenyl wherein phenyl is substituted by alkyl of one to ten carbon atoms, or naphthalenyl or naphthalenyl substituted by alkyl of one to ten carbon atoms.

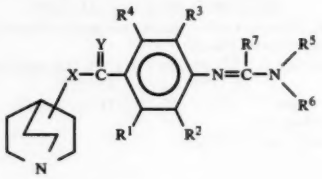
5,070,095

SUBSTITUTED 4-(AMIDINO)BENZAMIDES OF 1-AZABICYCLO[2.2.2]OCTAN-3- AND -4-AMINE AS GASTRIC PROKINETIC, ANTIEMETIC, AND ANXIOLYTIC AGENTS

Gunnar E. Jagdmann, Jr., and Harry R. Munson, Jr., both of Durham, N.C., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Dec. 12, 1990, Ser. No. 626,437
Int. Cl.[5] A61K *31/435;* **C07D** *221/02*
U.S. Cl. 514—305 **10 Claims**

1. A compound of the formula:



wherein

X=NH attached to 3 or 4 position of 1-azabicyclo[2.2.2]octane;

Y is O or S,

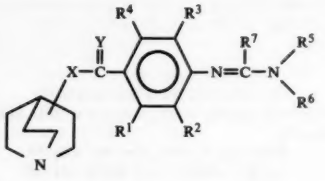
R^1, R^2, R^3 and R^4 are independently selected from the group consisting of H, halogen, C_1–C_4 alkyl, C_1–C_4 alkenyl, C_1–C_4 alkoxy, and OH;

R^5 and R^6 are independently selected from the group consisting of H, C_1–C_4 alkyl and cycl alkyl, or R^5 and R^6 together with the interposed nitrogen form a 5 or 6 membered heteroalicyclic ring;

R^7 is H or methyl,

the stereoisomers, the N-oxides and the pharmaceutically acceptable salts thereof.

7. A method of treatment for increasing gastric emptying in warm blooded animals which comprises internal administration of a therapeutically effective amount of a compound of the formula:



wherein

X=NH attached to 3 or 4 position of 1-azabicyclo[2.2.2] octane;

Y is O or S,

R^1, R^2, R^3 and R^4 are independently selected from the group consisting of H, halogen, C_1–C_4 alkyl, C_1–C_4 alkenyl, C_1–C_4 alkoxy, and OH;

R^5 and R^6 are independently selected from the group consisting of H, C_1–C_4 alkyl and cycloalkyl, or R^5 and R^6 together with the interposed nitrogen form a 5 or 6 membered heteroalicyclic ring;

R^7 is H or methyl,

the stereoisomers, the N-oxides and the pharmaceutically acceptable salts thereof.

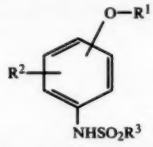
5,070,096

QUINOLINOXY PHENYLSULPHONAMIDES

Klaus Mohrs; Elisabeth Perzborn; Friedel Seuter, all of Wuppertal; Romanis Fruchtmann, Cologne, and Christian Kohlsdorfer, Erftstadt, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 587,594, Sep. 24, 1990, which is a continuation of Ser. No. 402,934, Sep. 5, 1989, abandoned, which is a continuation-in-part of Ser. No. 294,958, Jan. 6, 1989, abandoned, which is a continuation of Ser. No. 94,239, Sep. 8, 1987, abandoned. This application Nov. 15, 1990, Ser. No. 614,329
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, 3632329
Int. Cl.[5] C07D *215/16*
U.S. Cl. 514—311 **10 Claims**

1. A phenylsulphonamide of the formula



(I)

in which

R^1 represents a quinolyl radical which is unsubstituted or substituted by halogen, alkyl having 1 to 12 carbon atoms, cycloalkyl having 5 to 8 carbon atoms, alkoxy having 1 to 12 carbon atoms, cyano, halogenoalkyl having 1 to 8 carbon atoms, halogenoalkoxy having 1 to 8 carbon atoms, alkoxycarbonyl having 1 to 12 carbon atoms or alkylsulphonyl having 1 to 12 carbon atoms,

R^2 represents hydrogen, cyano, nitro, halogen, alkyl having 1 to 12 carbon atoms, alkoxy having 1 to 12 carbon atoms, halogenoalkyl having 1 to 8 carbon atoms, halogenoalkoxy having 1 to 8 carbon atoms or alkoxycarbonyl having 1 to 12 carbon atoms, and

R^3 represents phenyl which is unsubstituted or monosubstituted or disubstituted by halogen, halogenoalkyl having 1 to 8 carbon atoms, halogenoalkoxy having 1 to 8 carbon atoms, alkyl having 1 to 12 carbon atoms, alkoxy having 1 to 12 carbon atoms, alkythio having 1 to 12 carbon atoms, alkylsulphonyl having 1 to 12 carbon atoms, cyano or alkoxycarbonyl having 1 to 12 carbon atoms, the substituents being identical or different, or represents pentafluorophenyl or represents a straight-chain, branched or cyclic alkyl having up to 8 carbon atoms which is unsubstituted or substituted by halogen, phenyl, phenoxy, cyano, alkoxycarbonyl having 1 to 12 carbon atoms, alkoxy having 1 to 12 carbon atoms, alkylthio having 1 to 12 carbon atoms or trifluoromethyl,

or salt thereof.

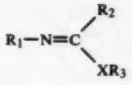
5,070,097

QUINOLYL AND ISOQUINOLYL INSECTICIDAL COMPOUNDS

Michael D. Broadhurst, Novato, Calif., assignor to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 263,604, Oct. 31, 1988, Pat. No. 4,994,473, which is a continuation-in-part of Ser. No. 121,839, Nov. 17, 1987. This application Oct. 19, 1990, Ser. No. 600,558
Int. Cl.[5] C07D *215/38;* **A61K** *31/47*
U.S. Cl. 514—313 **17 Claims**

1. A compound having the formula



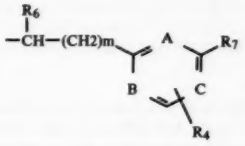
wherein

R_1 is quinolyl or isoquinolyl;

R_2 is methyl, ethyl, n-propyl, C_3–C_7 branched alkyl, C_3–C_4 cycloalkyl, C_2–C_6 alkenyl, C_2–C_6 haloalkenyl, C_1–C_6 haloalkyl, C_2–C_6 alkoxyalkyl or cyclopropyl substituted by up to four methyl groups or up to two halogens; X is oxygen, sulfur or —NH—; and

when X is oxygen, then R_3 is:

(a)



in which m is 0 or 1;

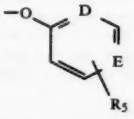
A, B and C are each carbon or nitrogen, provided that A, B and C are not all nitrogen and if two of A, B and C are nitrogen, than A and C are nitrogen;

R_4 is hydrogen, monohalo or dihalo;

R_6 is hydrogen, methyl, fluoro or ethynyl; and

R_7 is

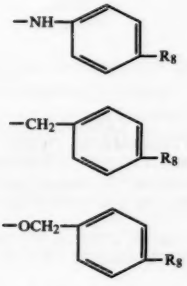
(i)



in which D and E are each carbon or nitrogen provided that both D and E are not nitrogen, and further provided that if either A, B or C is nitrogen, then D and E are both carbon; and

R_5 is hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, trifluoromethyl, cyano, C_1–C_4 alkylthio, C_1–C_4 alkylsulfonyl, or mono- or polyhalo;

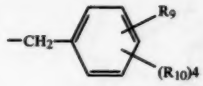
(ii)



in which R_8 is hydrogen or halogen; or

(iii) —O—CH_2—CH=CH_2

(b)

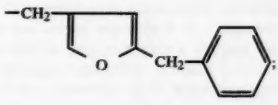


in which

(i) R_9 is 4-fluoro, 4-methoxymethyl, or 4-propargyl, and R_{10} is fluoro or

(ii) R_9 is 3- or 4-allyl, 3- or 4-propargyl, or 3- or 4-(mono- or dihalo)allyl, and R_{10} is hydrogen or fluoro;

(c)

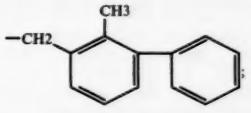


(d) 4-phenoxy-2-butyn-2-yl;

(e) 4-(benzyloxy)benzyl;

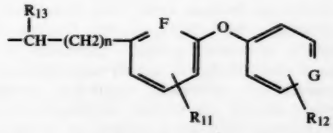
(f) 4-(4-fluorobenzyloxy)benzyl; or

(g)



and if X is sulfur or —NH—, then R_3 is

(h)



in which n is 0 or 1; F and G are independently nitrogen or carbon, provided that F and G are not both nitrogen; R_{11} is hydrogen or halo; R_{12} is hydrogen, mono- or di-halo, C_1–C_4 alkyl, C_1–C_4 alkoxy, trifluoromethyl, cyano, C_1–C_4 alkylthio, C_1–C_4 alkylsulfonyl; and R_{13} is hydrogen or methyl; (i) pentafluorobenzyl; or (j) 2-methyl-3-phenylbenzyl.

16. A method for controlling insects comprising applying to an insect, the locus of an insect or a locus at which insecticidal control is desired, an insecticidally effective amount of a compound according to claim 1.

5,070,098

SUBSTITUTED PYRAZOLINE DERIVATIVES, PESTICIDAL COMPOSITIONS AND USE

Rainer Fuchs, Wuppertal; Ulrike Wachendorff-Neumann, Monheim; Benedikt Becker, Appiano; Christoph Erdelen, Leichlingen, and Wilhelm Stendel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

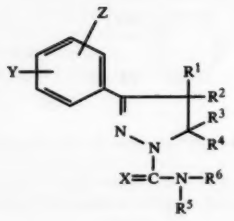
Filed Jan. 15, 1991, Ser. No. 641,417

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1990, 4001931; Oct. 10, 1990, 4032089

Int. Cl.[5] A01N *43/56, 43/647;* **C07D** *403/04, 403/14*

U.S. Cl. 514—359 **5 Claims**

1. Substituted pyrazoline derivatives of the general formula



in which

R^1 represents an unsaturated five-membered heterocycle which contains 1 to 4 nitrogen atoms and which is attached by way of a ring nitrogen, which is optionally substituted and which is optionally benzo-fused,

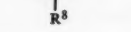
R^2 represents hydrogen, alkyl, optionally substituted cycloalkyl, halogenoalkyl, halogenoalkylthio, alkoxycarbonyl or trialkylsilyl,

R^3 represents hydrogen or alkyl,

R^4 represents hydrogen or alkyl,

R^5 represents hydrogen, alkyl, phenyl or alkylthio,

R^6 represents optionally substituted alkyl or optionally substituted cycloalkyl, or represents the radical



where R^7 and R^8 can be identical or different and represent hydrogen, halogen, alkyl, nitro, cyano, halogenoalkyl, alkoxy, halogenoalkoxy, alkylthio, halogenoalkylthio, optionally substituted phenoxy, optionally substituted mono- or dialkylamino, optionally substituted cycloalkyl, alkoxycarbonyl, optionally substituted arylthio, alkenyloxy, alkinyl, alkylthionyl, alkylsulphonyl, halogenoalkylthionyl, halogenoalkylsulphonyl or halogenoalkoxycarbonyl, or where R^7 and R^8 together represent a bivalent radical which optionally contains one or two oxygen atoms and which is optionally substituted,

X represents oxygen or sulphur and Y and Z can be identical or different and represent hydrogen, alkyl, halogen, halogenoalkyl, alkoxy, alkylthio, halogenoalkoxy, halogenoalkylthio, alkoxycarbonyl, halogenoalkoxycarbonyl, optionally substituted aryloxy, optionally substituted arylthio, alkenyloxy, alkinyl, alkylthionyl, alkylsulphonyl, halogenoalkylthionyl, halogenoalkylsulphonyl, amino, nitro or cyano, or where Y and Z together represent optionally halogen-substituted 3,4-methylenedioxy or 3,4-ethylenedioxy.

5,070,099

ARYLTHIOALKYLPHENYL CARBOXYLIC ACIDS, DERIVATIVES THEREOF, COMPOSITIONS CONTAINING SAME METHOD OF USE

Steven E. Hall, Trenton, and Philip D. Stein, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 264,939, Oct. 31, 1988, Pat. No. 5,006,542. This application Feb. 4, 1991, Ser. No. 650,126

Int. Cl.[5] A61K *31/41, 31/235, 31/24, 31/195, 31/19, 31/18*

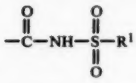
U.S. Cl. 514—381 **17 Claims**

1. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound having the structure

(I)

wherein Ar is an aryl group which is unsubstituted or substituted with one, two or three of halogen, lower alkyl, lower alkoxy, phenyl, hydroxy, alkanoyl, aroyl, alkylamino, alkoxycarbonyl or carboxy;

X is COOR wherein R is hydrogen, alkali metal, lower alkyl or X is 5-tetrazolyl or



wherein R^1 is lower alkyl or aryl

p is 1 to 5;

m is 1 to 4;

and the $(CH_2)_m$ and $(CH_2)_p$ groups may be unsubstituted or optionally substituted with one or two lower alkyl groups and/or are one or two lower alkoxy groups or a pharmaceutically acceptable salt thereof.

5,070,100

SPIRO-TRICYCLICAROMATIC SUCCINIMIDE DERIVATIVES

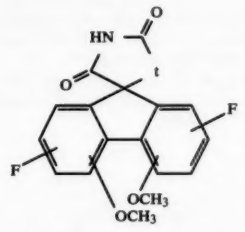
Billie M. York, Jr., Crowley, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation-in-part of Ser. No. 94,636, Sep. 9, 1987, Pat. No. 4,864,028, which is a continuation-in-part of Ser. No. 5,859, Jan. 21, 1987, abandoned, which is a continuation of Ser. No. 776,569, Aug. 14, 1985, abandoned, which is a continuation of Ser. No. 532,168, Sep. 14, 1983, Pat. No. 4,537,892. This application Sep. 5, 1989, Ser. No. 402,035

Int. Cl.[5] A61K *31/415;* **C07D** *235/02*

U.S. Cl. 514—387 **13 Claims**

1. A compound of the formula



wherein t is selected from the group consisting of NH.

5,070,101

METHOD AND PHARMACEUTICAL COMPOSITION FOR THE TREATMENT OF SCHIZOPHRENIA

Ram Kaminski, Riverdale, N.Y., assignor to Mount Sinai School of Medicine of the City University of New York, New York, N.Y.

Filed Feb. 14, 1991, Ser. No. 655,759

Int. Cl.[5] A61K *31/34, 31/415*

U.S. Cl. 514—399 **4 Claims**

1. A method of treating schizophrenia comprising administering to a patient exhibiting negative symptoms of schizophrenia a therapeutically effective amount of a histamine H_2-antagonist that crosses the blood/brain barrier.

5,070,102

MEDICAMENTS FOR THE TREATMENT OF CEREBRAL APOPLEXY

Jörg Traber, Lohmer, and Gerhard-Wilhelm Bielenberg, Amoeneburg, both of Fed. Rep. of Germany, assignors to Troponwerke GmbH & Co., Cologne, Fed. Rep. of Germany

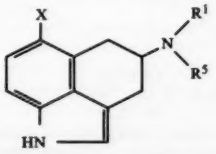
Division of Ser. No. 407,161, Sep. 14, 1989, Pat. No. 4,988,700. This application Sep. 10, 1990, Ser. No. 579,414

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1988, 3831888

Int. Cl.[5] A61K *31/405*

U.S. Cl. 514—415 3 Claims

1. A method of treating cerebral apoplexy in a patient in need thereof which comprises administering to said patient an amount effective therefor of a serotonin agonist which has a binding strength of less than 10,000 nmol/l on binding to $5HT_{1A}$ receptors and is selected from the group consisting of aminotetrahydrobenzindole, indolamine, aminoalkylbenzodioxane, aminotetralin, amino-chroman, amino-thiopyran, indolyl-alkyl-peperidine and tetrahydropyridine] a aminotetrahydrobenzindole of the formula



(II)

in which

X represents H, OCH_3, OH, SCH_3, halogen, CN or $CONH_2$,

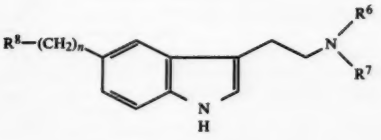
R^1 represents hydrogen or C_1 to C_6 alkyl,

R^5 has the meaning indicated above for R^1 or represents -Y-Z, where

Y represents a straight-chain saturated or unsaturated alkylene chain having up to 6 carbon atoms, and

Z represents an amino alkoxy (C_1 to C_6), sulphonamido or carboxamido group or a heterocycle,

and a salt thereof and an indolamine of the formula



where

n represents 1 and

R^8 represents $CONR^1R^2$ or $SO_2NR^1R^2$, where R^1 and R^2 each independently represent hydrogen or C_1 or C_6 alkyl,

R^6 and R^7 are identical or different and denote hydrogen or lower alkyl (C_1 to about C_6),

or

n represents the number 0,

R^8 represents $CONR^1R^2$, where R^1 and R^2 have the abovementioned meanings,

R^6 and R^7 have the abovementioned meanings,

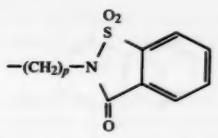
or

n represents the number 0,

R^8 represents H, OH or OCH_3,

R^6 denotes hydrogen or methyl, and

R^7 represents the radical



where p represents the values 2, 3, 4 or 5, and a salt thereof.

5,070,103

NAPHTHALENE DERIVATIVES AND COMPOSITION AND METHODS OF USE, AND ALDEHYDE INTERMEDIATES

Tameo Iwasaki, Nishinomiya, and Kohki Takashima, Tokyo, both of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 144,650, Jan. 11, 1988, Pat. No. 4,897,418, which is a division of Ser. No. 814,805, Dec. 30, 1985, Pat. No. 4,771,072. This application Jan. 2, 1990, Ser. No. 459,859

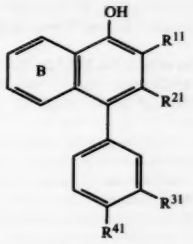
Claims priority, application Japan, Jan. 16, 1985, 60-3090

The portion of the term of this patent subsequent to Sep. 13, 2005, has been disclaimed.

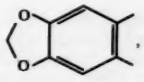
Int. Cl.[5] A61K *31/36, 31/235;* C07D *317/70;* C07C *69/94*

U.S. Cl. 514—463 25 Claims

1. A naphthalene derivative of the formula:

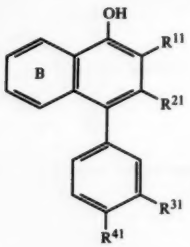


wherein each of R^{11} and R^{21} is a lower alkoxycarbonyl, each of R^{31} and R^{41} is a lower alkoxy, and Ring B is an unsubstituted benzene ring, a benzene ring having a substituent of a lower alkylenedioxy attached to two adjacent carbon atoms in the benzene ring or a benzene ring having one to 3 substituent(s) selected from the group consisting of a lower alkyl, a lower alkoxy, a phenyl-lower alkoxy, hydroxy and a halogen atom, with the proviso that if both of R^{11} and R^{21} are methoxycarbonyl and Ring B is a benzene ring of the formula:

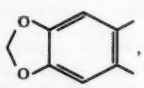


each of R^{31} and R^{41} is a lower alkoxy of at least 2 carbon atoms, or a pharmaceutically acceptable salt thereof.

15. A pharmaceutical composition, having a hypolipidemic activity, which comprises a therapeutically effective amount of a naphthalene derivative of the formula:



wherein each of R^{11} and R^{21} is a lower alkoxycarbonyl, each of R^{31} and R^{41} is a lower alkoxy, and Ring B is an unsubstituted benzene ring, a benzene ring having a substituent of a lower alkylenedioxy attached to two adjacent carbon atoms in the benzene ring or a benzene ring having one to 3 substituent(s) selected from the group consisting of a lower alkyl, a lower alkoxy, a phenyl-lower alkoxy, hydroxy and a halogen atom, with the proviso that if both R^{11} and R^{21} are methoxycarbonyl and Ring B is a benzene ring of the formula:



each of R^{31} and R^{41} is a lower alkoxy of at least 2 carbon atoms, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier therefor.

5,070,104

METHODS OF CHELATING METAL AND NOVEL COMPOSITIONS THEREFOR

Michael W. Pariza, and Yeong L. Ha, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 313,120, Feb. 17, 1989, Pat. No. 5,017,614. This application Feb. 2, 1990, Ser. No. 474,583

Int. Cl.[5] A61K *31/22, 31/20*

U.S. Cl. 514—549 **6 Claims**

1. A method of chelating metal ions in a solution which comprises adding to a solution containing metal ions an effective amount of a member selected from at least one conjugated linoleic acid, the methyl ester thereof, the ethyl ester thereof and non-toxic salts thereof to chelate the metal ions.

5,070,105

STABILIZED ANTIMICROBIAL COMPOSITIONS

Jeanne Segall, 3 Shimshon Street, and Leonard M. Shorr, 39 Hapalmach Street, both of Haifa, Israel

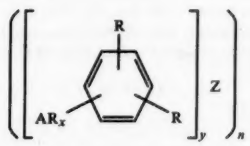
Continuation-in-part of Ser. No. 54,217, May 26, 1987, abandoned, which is a continuation of Ser. No. 713,783, Mar. 20, 1985, abandoned, which is a continuation of Ser. No. 551,415, Nov. 14, 1983, abandoned. This application May 3, 1989, Ser. No. 346,724

Claims priority, application Israel, Nov. 17, 1982, 67282

Int. Cl.[5] A01N *37/18*

U.S. Cl. 514—626 **11 Claims**

1. A stabilized antimicrobial composition, comprising a solution of an antimicrobial amount of from about 5 to about 30 percent of 2,2-dibromo-3-nitrilopropionamide in water miscible organic solvents in which 2,2-dibromo-3-nitrilo-propionamide is at least partially soluble selected from the group consisting of di-, tri- and polyalkylene glycols of ethylene and propylene, or a mono- or di- lower alkyl or phenyl ether, or ester thereof, propylene glycol and Cellosolve compounds and any mixture thereof, wherein the composition comprises a stabilizing amount of at least one chain breaking anti-oxidant of the phenolic or amine type in the range of from 0.005 to 0.2% by weight of the total composition, wherein said phenolic or amine type chain breaking antioxidant is represented by the formula:



wherein:

R=H, straight chain, branched or cyclic alkyl, phenylalkyl or phenyl radical, being the same or different when there is more than one wherein said alkyl is a C_1 to C_9 alkyl;

A=oxygen or nitrogen;

Z=R, AR_x, alkoxy methylene, methylene or alkylidene radical; and

n, x, y=1 or 2.

5,070,106

COMPOUNDS ACTIVE ON THE CARDIOVASCULAR SYSTEM

Cesare Casagrande, Arese; Gabriele Norcini, Somma Lombardo; Francesco Santangelo, Milan, and Claudio Semeraro, Bresso, all of Italy, assignors to Simes Societa Italiana Medicinali e Sintetici S.p.A., Vicenza, Italy

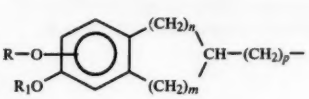
Continuation of Ser. No. 288,263, Dec. 22, 1988, abandoned. This application Feb. 22, 1991, Ser. No. 659,542

Claims priority, application Italy, Dec. 23, 1987, 23183 A/87

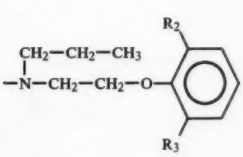
Int. Cl.[5] A61K *31/135;* **C07C** *217/58, 217/76*

U.S. Cl. 514—651 **4 Claims**

1. A compound of formula



(I)



wherein R and R_1 represent hydrogen

the group O-R is bonded to one of the positions adjacent to the O-R_1 group;

n and p represent an integer selected between 0 and 1;

m represents an integer selected from 1, 2, 3 and 4 so that n+p=1 and m+n represents an integer selected from 2, 3 and 4; and

R_2 and R_3 the same or different, represent hydrogen, halogen, alkyl or alkoxy;

and their salts with pharmaceutically acceptable acids.

4. A method for the treatment of hypertension, cerebral insufficiency and decompensation, and cerebral and peripheral vascular disease comprising administering an anti-hypertensive, anti-cardiac insufficiency/decompensating or anti-cerebral and peripheral vascular disease effective amount of a compound according to claim 1.

5,070,107

SYSTEMIC ANTIVIRAL TREATMENT

David H. Katz, La Jolla, Calif., assignor to Lidak Pharmaceuticals, La Jolla, Calif.

Continuation-in-part of Ser. No. 345,084, Apr. 28, 1989, Pat. No. 4,874,794. This application Nov. 2, 1989, Ser. No. 430,822

Int. Cl.[5] A01N *31/00*; A61K *31/045*; A01J *21/00*

U.S. Cl. 514—724 13 Claims

1. A method of treating humans or other mammals for viral infections, comprising intravenous introduction into the human or other mammal suspected of having a viral infection with an effective amount of from about 0.1 mg to about 2 gm per 50 kg of body weight of a composition consisting of one or more C-27 to C-32 aliphatic alcohols in a physiologically compatible carrier.

5,070,108

METHODS OF TREATING OSTEOPOROSIS, INCREASING BONE MINERAL CONTENT AND PREVENTING THE OCCURRENCE OF COMPRESSION FRACTURES IN A MAMMAL

David J. Margolis, Philadelphia, Pa., assignor to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Oct. 12, 1990, Ser. No. 596,676

Int. Cl.[5] A61K *31/07*

U.S. Cl. 514—725 17 Claims

1. A method of treating osteoporosis comprising administering to a mammal in need of such treatment a retinoid or a pharmaceutically acceptable salt thereof in an amount effective for treating said osteoporosis.

5,070,109

RECOVERY OF HYDROCRABON PRODUCTS FROM ELASTOMERS

Thomas J. Ulick, Barrington, and William E. Carner, Round Lake Beach, both of Ill., assignors to Rubber Waste, Inc., Zion, Ill.

Filed Dec. 20, 1989, Ser. No. 453,711

Int. Cl.[5] C08J *11/04, 11/20*; C08L *95/00*

U.S. Cl. 521—41 46 Claims

1. Method for the recovery of hydrocarbon from elastomeric products which comprises:

a.) passing elastomeric products selected from the group consisting of products of natural rubber and products of synthetic rubber into a substantially air-free thermal processing zone;

b.) contacting said elastomeric products in said thermal processing zone with a low volatility liquid heat transfer medium comprising a high molecular weight hydrocarbon liquid;

c.) maintaining said thermal processing zone under elevated temperature conditions sufficient to generate a first hydrocarbon vapor from the elastomeric products within said processing zone;

d.) passing said first hydrocarbon vapor from said thermal processing zone into a condensation zone;

e.) recovering from said condensation zone a second hydrocarbon vapor containing light hydrocarbons selected from the group consisting of hydrocarbons having one, two, three, four and five carbon atoms per molecule and mixtures thereof;

f.) recovering from said condensation zone a light fraction first hydrocarbon liquid comprising hydrocarbons having more than five carbon atoms per molecule;

g.) recovering a light fraction elastomeric first hydrocarbon solid from said processing zone; and,

h.) recovering a heavy fraction elastomeric second hydrocarbon solid from said processing zone.

30. Method for the recovery of hydrocarbons from elastomeric products which comprises:

a.) passing elastomeric products selected from the group consisting of products of natural rubber and products of synthetic rubber into a substantially air-free thermal processing zone;

b.) contacting said elastomeric products in said thermal processing zone with a low volatility liquid heat transfer medium comprising a high molecular weight hydrocarbon;

c.) maintaining said thermal processing zone under elevated temperature conditions sufficient to generate a first hydrocarbon vapor from the elastomeric products within said processing zone;

d.) passing said first hydrocarbon vapor from said thermal processing zone into a condensation zone;

e.) recovering from said condensation zone a second hydrocarbon vapor containing light hydrocarbons selected from the group consisting of hydrocarbons having one, two, three, four and five carbon atoms per molecule and mixtures thereof;

f.) recovering from said condensation zone a light fraction first hydrocarbon liquid comprising hydrocarbons having more than five carbon atoms per molecule;

g.) withdrawing a heavy fraction second hydrocarbon liquid comprising thermally cracked elastomeric hydrocarbons and liquid heat transfer medium from said thermal processing zone; and,

h.) cooling said second hydrocarbon liquid to provide a recovered elastomeric solid product comprising said thermally cracked elastomeric hydrocarbons and heat transfer medium.

5,070,110

BLENDS OF ALKYLENE GLYCOLS AND RELATIVELY HIGH EQUIVALENT WEIGHT ACTIVE HYDROGEN COMPOUNDS CONTAINING MULTIPURPOSE ADDITIVES

Robert Carswell, and Hugo E. Bernardi, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 25, 1989, Ser. No. 398,802

Int. Cl.[5] C08G *18/16, 18/18*

U.S. Cl. 521—51 30 Claims

1. A compatibilized active hydrogen compoundalkylene glycol composition comprising components:

(A) a relatively high equivalent weight active hydrogen compound having an average of at least about 1.8 active hydrogen containing groups per molecule and an average molecular weight of from about 500 to about 5000 per active hydrogen containing group:

(B) an alkylene glycol which is incompatible with component (A) at the relative proportions thereof present in the composition: said composition having dissolved therein:

(C) a compatibilizing and catalytic amount of an additive containing (1) a urea compound and (2) a transition metal salt of a carboxylic acid wherein said metal is selected from Groups I-B, II-B, V-A, IV-B, V-B, VI-B, VII-B or VIII of the Periodic Table of the Elements said composition containing a sufficient quantity of at least one amine group-containing material such that component (2) is soluble in said composition.

5,070,111

FOAMING THERMOPLASTIC ELASTOMERS

Garry L. Dumbauld, Barberton, Ohio, assignor to Advanced Elastomer Systems, L.P., St. Louis, Mo.

Filed Mar. 13, 1991, Ser. No. 668,561

Int. Cl.[5] C08J *9/12*

U.S. Cl. 521—82 14 Claims

1. The process of foaming a thermoplastic elastomer composition, which composition comprises a blend of 10 to 90 parts by weight of crystalline alpha olefin polymer having 1 to 4 carbon atoms and, correspondingly, 90 to 10 parts by weight of rubber, comprising the successive steps of

(A) heating the composition to a temperature above the melting point of the plastic,
(B) admixing to the composition, as the sole foaming agent from 0.1 to 10 weight percent of water under pressure and
(C) releasing the mixture to atmospheric pressure.

5,070,112

PROCESS FOR MAKING FLEXIBLE POLYURETHANE FOAM

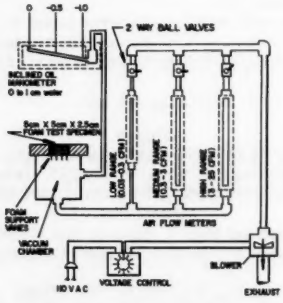
Wojciech Grabowski, Versoix, Switzerland, assignor to Union Carbide Chemicals and Plastics Technology Corporation, Danbury, Conn.

Filed Nov. 13, 1990, Ser. No. 612,520

Claims priority, application United Kingdom, Nov. 14, 1989, 8925667

Int. Cl.[5] C08J 9/12

U.S. Cl. 521—112 **4 Claims**



1. A process for preparing flexible polyurethane foam, which process comprises reacting and foaming a foam formulation comprising:

(1) a polyol selected from the group consisting of polyether polyols and polymer polyols, wherein the polyol is one having an average functionality in the range 2 to 6 and in which less than 20% of the hydroxyl groups are primary hydroxyl groups,
(2) an isocyanate composition containing toluene diisocyanate,
(3) a catalyst for the polyurethane forming reaction, and
(4) a blowing agent, characterized in that the foam formulation further comprises a silicone surfactant composition which comprises a mixture of

(a) between 5 and 20 wt % of a lower molecular weight silicone surfactant having the formula

$$(R^1)_3SiO(Si(CH_3)(R^1)O)_x(Si(CH_3)(R^2)O)_ySi(R^1)_3$$

wherein

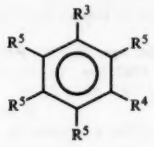
(i) x and y are such that

$$x + y = 2 - 10$$

and

$$\frac{y}{x+y} = 0.1 - 0.5$$

(ii) the R^1 groups are independently selected from C_1 to C_{10} hydrocarbyl groups
(iii) the R^2 group are independently selected from groups having the generic formula



wherein R^3 is a divalent hydrocarbyl group; R^4 is a polar moiety selected from the group consisting of =OH, $-NH_2$, Cl, —Br, and $-CH_2OH$, and the R^5 groups are independently selected from hydrogen or C_1 to C_{10} alkyl or alkoxy groups; and

(b) between 95 and 80 wt % of a high molecular weight silicone surfactant having the formula

$$(R^1)_3SiO(Si(CH_3)(R^1)O)_p(Si(CH_3)(R^6)O)_qSi(R^1)_3$$

(i) p=40–150

(ii) q=3–15

(iii) R^6 is an ethylene oxide/propylene oxide copolymer having a molecular weight in the range 1500–5000 capped with alkoxy at one end and bound to silicon by a divalent hydrocarbyl group;

the molecular weight of the high molecular weight silicone surfactant being in the range 10,000 to 50,000.

5,070,113

BLOWING COMPOSITIONS

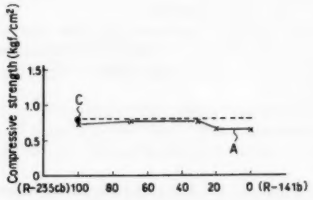
Yukio Omure, and Kisuke Kitano, both of Osaka, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

Filed Jun. 5, 1990, Ser. No. 533,352

Claims priority, application Japan, Jun. 5, 1989, 1-143335; Jun. 12, 1989, 1-149147

Int. Cl.[5] C08J 9/14

U.S. Cl. 521—131 **2 Claims**



1. In a process for producing a foamed body of polyurethane using a blowing agent, an improvement wherein the blowing agent comprises (a) at least one of chloropentafluoropropane and isomers thereof and (b) 1,1-dichloro-1-fluoroethane.

5,070,114

ISOCYANATE COMPOSITION AND PROCESS FOR MAKING FLEXIBLE FOAMS THEREFROM

Arun Watts, Brussels; Louis Muller, Ottenburg; Gabriel Verhelst, Herent; Mireille De Witte, Gent; Tu Pham, Grez-Doiceau, and Alain Parfondry, Evere, all of Belgium, assignors to Imperial Chemical Industries PLC, London, England

Filed Apr. 16, 1990, Ser. No. 508,726

Claims priority, application United Kingdom, Apr. 14, 1989, 8908490

Int. Cl.[5] C08G 18/14

U.S. Cl. 521—159 **11 Claims**

1. A liquid isocyanate-containing prepolymer composition having an average isocyanate functionality greater than 2 and an NCO content of from 2 to 12% by weight, as obtainable by

reacting an isocyanate reactive polymer having an average nominal functionality of from 2 to 4 and an average equivalent weight of from about 500 to about 5000, with a stoichiometric excess of a diphenylmethane diisocyanate composition containing at least 2% by weight of 2,4'-diphenylmethane diisocyanate and having an average isocyanate functionality in the range from 2 to 2.3.

5,070,115

SUBSTANTIALLY CLOSED-CELL RIGID FOAMS CONTAINING URETHANE, UREA AND BIURET GROUPS AND A PROCESS FOR THEIR PRODUCTION

Rainer Welte, Leverkusen, and Hans-Joachim Scholl, Colonge, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 1, 1991, Ser. No. 663,221

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1990, 4007330

Int. Cl.[5] C08G *18/14*

U.S. Cl. 521—173 **11 Claims**

1. A process for the production of substantially closed-cell rigid foams containing urethane, urea or biuret groups comprising reacting

a) an organic polyisocyanate with

b) a mixture of high molecular weight polyols which includes

b1) a polyester containing at least two hydroxyl groups and having an OH number greater than 150 or

b2) a polyether having at least two hydroxyl groups and an OH number greater than 200 or

b3) a mixture of b1) and b2) and

b4) an ethylene oxide containing polyether having at least two hydroxyl groups and an OH number below 100 in the presence of

c) water and

d) a catalyst at an isocyanate to hydroxyl group index of from about 90 to about 150.

5,070,116

PRECERAMIC ORGANOSILICON-METAL CARBONYL POLYMERS

Dietmar Seyferth, Lexington; Christine A. Sobon, Watertown, both of Mass., and Jutta Borm, Bruchkoebel-Rossdorf, Fed. Rep. of Germany, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 360,846, Jun. 2, 1989, abandoned. This application Feb. 7, 1991, Ser. No. 652,468

Int. Cl.[5] C08F *2/46*

U.S. Cl. 523—22 **12 Claims**

1. An organosilicon-metal polymer prepared by a method comprising:

(a) mixing a polycarbosilane polymer containing a multiplicity of Si—H functional groups with a sufficient quantity of a metal carbonyl for said metal carbonyl to be incorporated into the organosilicon polymer, wherein the metal is selected from the Group VIII metals; and

(b) allowing the mixture of step (a) to react by initiating an incorporated reaction, thereby forming said organosilicon-metal polymer.

5,070,117

AROMATIC VINYL ETHER COMPOUNDS AND COMPOSITIONS, AND METHOD OF MAKING THE SAME

Philip T. Klemarczyk, Collinsville, and Yoshihisa Okamoto, Avon, both of Conn., assignors to Loctite Corporation, Hartford, Conn.

Division of Ser. No. 543,248, Jun. 25, 1990, Pat. No. 5,004,842. This application Nov. 19, 1990, Ser. No. 615,205

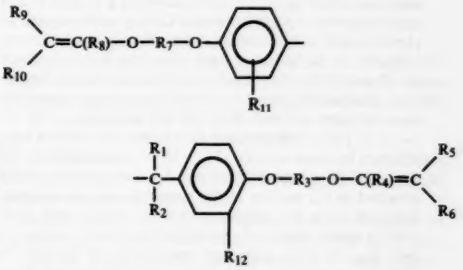
Int. Cl.[5] C08F *2/46, 12/24;* C08T *3/28;* C07C *41/00*

U.S. Cl. 522—31 **7 Claims**

1. A cationically curable vinyl ether composition, comprising:

(a) a vinyl ether component selected from the group consisting of:

(i) aromatic vinyl ether components of the formula:



wherein:

R_1, R_2, R_4, R_5, R_6, R_8, R_9 and R_{10} are independently selected from hydrogen, halogen, and C_1–C_8 alkyl radicals;

R_3 and R_7 are independently selected from C_1–C_8 alkylene radicals; and

R_{11} and R_{12} are independently selected from allyl and methallyl.

(ii) aryl polyol-reacted, chain-extended derivatives thereof; and (iii) mixtures of compounds (i) and/or (iii);

(b) an effective amount of a cationic photoinitiator which is initiatingly effective for polymerization of the vinyl ether component in the presence of initiating radiation.

5,070,118

RADIATION-SELF-SENSITIZED SILICONE POLYMERS

Richard P. Eckberg, Saratoga, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 170,952, Mar. 21, 1988, Pat. No. 4,988,743. This application Jan. 22, 1991, Ser. No. 643,312

Int. Cl.[5] C08G *77/18;* C08L *83/06;* C08F *283/12*

U.S. Cl. 522—99 **13 Claims**

1. A method for producing an acrylic or methacrylic functional polysiloxane, self-sensitized to UV radiation, comprising the steps of:

(a) reacting in the absence of UV radiation a base polysiloxane having functional groups reactive with acid chlorides, carboxylic acids or carboxylic acid esters with acrylic or methacrylic acid or derivatives and benzoic acid, substituted benzoic acid, or derivatives, and

(b) recovering said acrylic or methacrylic functional polysiloxane.

5,070,119

FLEXIBLE INTUMESCENT COATING COMPOSITION

Richard M. Nugent, Jr., Allison Park; Thomas A. Ward, Gibsonia; Paul D. Greigger, Allison Park, and Jerome A. Seiner, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 589,368, Sep. 28, 1990. This application Mar. 11, 1991, Ser. No. 666,951

Int. Cl.[5] C09K *21/14;* C08J *9/02*

U.S. Cl. 523—179 **17 Claims**

1. An intumescent curable composition comprising:

(a) a polyepoxide resin,

(b) a curing agent adapted to cure the polyepoxide resin,

(c) an additive component comprising a mixture of materials adapted to provide a source of

(i) zinc

(ii) boron,

(iii) phosphorus and

(iv) an expansion gas upon thermal decomposition, said composition being capable of forming a carbonaceous

char upon exposure to heat or flame, with the proviso that the cured, unburned composition has sufficient flexibility that it passes at least 10 continuous cycles of a cold cycle test without cracking when the composition is applied at a thickness of 0.5 inch (12.7 millimeters) to a 10 inch (0.254 meter) section of a 4W13 I-beam having two thermocouples attached to the surface, allowed to cure at ambient temperature for 16 hours, force cured for 5 days at about 60° C. and subjected to the cold cycle test wherein for one cycle the beam is placed in a freezer operating at a temperature between about 0° F. (−18° C.) and about −10° F. (−23° C.) for sufficient time for the steel to reach a temperature between about 0° F. (−18° C.) and about (−10° F.) −23° C. as determined by the two thermocouples attached to the surface of the beam beneath the coating, removed from the freezer and a 50 square inch area (0.0323 square meter) of the surface warmed by passing a heat gun, 14 amps, minimum temperature at tip 500° F. (260° C.) at a distance of 0.5 inch (12.7 millimeter) from the surface, uniformly over the surface until the surface temperature reaches 110° F. (43° C.) within a 3 minute period, as determined by a thermocouple moved about the surface, and allowed to stand for at least 2 hours at ambient temperature.

5,070,120

AQUEOUS DISPERSION OF CATIONIC CROSSLINKED RESIN PARTICLES FROM RESIN HAVING AT LEAST TWO VINYL GROUPS

Hiroyuki Sakamoto, Nishinomiya; Kenshiro Tobinaga, Kawanishi, and Yasuyuki Tsuchiya, Hirakata, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jul. 7, 1989, Ser. No. 376,601

Claims priority, application Japan, Jul. 8, 1988, 63-171634; Mar. 28, 1989, 1-75588

Int. Cl.[5] C08K *3/20*

U.S. Cl. 523—412 **11 Claims**

1. An aqueous dispersion of cationic crosslinked resin particles prepared by dispersing or emulsifying in an aqueous medium (A) a cationic aqueous resin and (B) a resin having at least two polymerizable vinyl groups and a number average molecular weight of 400 to 20,000, followed by radical-polymerizing.

5,070,121

SOLVENT-FREE, LOW-MONOMER OR MONOMER-FREE POLYMERIZABLE HOT MELT COMPOSITION

Rudolf Hinterwaldner, Moosach-Altenburg, and Georg Bolte, Vechelde, both of Fed. Rep. of Germany, assignors to Schmalbach Lubeca AG, Fed. Rep. of Germany

Filed Apr. 25, 1989, Ser. No. 343,945

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1988, 3814111

Int. Cl.[5] C08L *33/08, 33/10;* **C08G** *63/48, 63/91*

U.S. Cl. 524—31 **30 Claims**

1. A solvent-free, low-monomer or monomer-free, polymerizable hot melt suitable for use as a corrosion and abrasion resistant coating for formation of a protective film with barrier properties on planar substrates and shaped bodies of metal, plastics, cellulose materials and/or inorganic materials, comprising a polymerizable component selected from the group consisting of

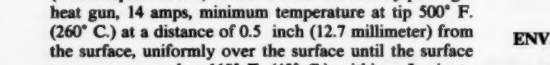
(A) at least one polymerizable, hydroxyl-containing polymer having an average molecular weight ($\overline{M}_w$) of between about 1,000 and about 500,000 and a glass transition temperature (T_g)≧+20° C.;

(B) at least one polymerizable, linear straight chain or branched polyester or copolymer thereof having an average molecular weight ($\overline{M}_w$) between about 800 and about 50,000 and a glass transition temperature (T_g)≧−50° C.;

(C) components (A) and (B) in admixture; and

(D) at least one of compounds (A) and (B) in admixture with a polymerizable, ethylenically-unsaturated group carrying oligomer consisting of acrylic, methacrylic, ether, ester, urethane, amide, imide, epoxy, siloxane, phenol, novolak or mercapto compounds and having an average molecular weight ($\overline{M}_w$) of about 400 to about 10,000 and

wherein at least one of said polymerizable components present in said hot melt is functionalized with at least one dimeric or oligomeric acrylic acid of the formula



where each R may independently be H, -CN, halogen, or an alkyl group having from 1 to 4 carbon atoms, and m is a number between 1 and 5.

5,070,122

ENVIRONMENTALLY DEGRADABLE POLYMER BLENDS

Jeffrey J. Vanderbilt, and Charles M. Neeley, both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 15, 1989, Ser. No. 366,825

Int. Cl.[5] C08L *3/00, 3/02, 5/02*

U.S. Cl. 524—47 **24 Claims**

1. A composition comprising:

(a) an ethylene-carbon monoxide copolymer having a melt index in the range of about 0.2 up to 2,000 grams per 10 minutes at 190° C. and a carbon monoxide content, based on the weight of the ethylene-carbon monoxide copolymer component, falling in the range of about 0.2 up to 50 wt %, and

(b) in the range of about 0.5 up to 70 wt %, based on the weight of the total composition, of a polysaccharide comprised of linear and branched polymers of alpha-D-glucopyranosyl units, and optionally

(c) up to about 10 wt %, based on the weight of the total composition of at least one triglyceride ester of an unsaturated fatty acid.

5,070,123

METHOD FOR IMPROVING THE STORAGE STABILITY OF POLYMER MODIFIED ASPHALT

Lyle E. Moran, Sarnia, Canada, assignor to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation-in-part of Ser. No. 237,028, Aug. 29, 1988, abandoned. This application Aug. 23, 1989, Ser. No. 397,215

Int. Cl.[5] C08L *95/00*

U.S. Cl. 524—69 **27 Claims**

1. A method for improving the storage stability of an asphalt that contains from above 1.0 to about 15 wt.% of a polymer which comprises

(a) adding from about 0.2 to about 5 wt.% of an inorganic acid to the asphalt to form an acid treated asphalt, and thereafter,

(b) adding the polymer to the acid treated asphalt to form an acid treated polymer modified asphalt which has a greater storage stability than that obtained had the acid been added with or after the polymer.

5,070,124

SULFIDE ANTIOXIDANTS FOR STABILIZING CROSSLINKED POLYOLEFINS

Joseph M. Bohen, King of Prussia, and James L. Reilly, Towamencin, both of Pa., assignors to Atochem North America, Inc., Philadelphia, Pa.

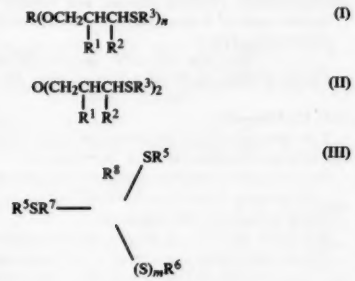
Filed Oct. 31, 1989, Ser. No. 429,899

Int. Cl.[5] C08K *5/524, 5/36*

U.S. Cl. 524—151 **31 Claims**

1. A composition comprising a crosslinked polyolefin resin and an amount of organic sulfide antioxidant sufficient to stabilize the resin against thermal or oxidative degradation,

wherein the organic sulfide antioxidant is represented by Formula I, II or III:



(I)

(II)

(III)

wherein:

m is 0 or 1;

n is an integer of 2 to 15;

R is a substituted or unsubstituted multivalent alkyl group of 2 to 30 carbons, or a substituted or unsubstituted multivalent cycloalkyl group of 5 to 20 carbons, a substituted or unsubstituted multivalent alkyl group of 2 to 30 carbons where any of up to 6 carbon atoms are replaced with an O or S heteroatom, a substituted or unsubstituted multivalent cycloalkyl group of 5 to 20 carbons where any of up to 6 carbon atoms are replaced with an O heteroatom, with the proviso that the heteroatoms must be separated from each other and from the portion of the compound to which the R group is bonded by at least one carbon atom, the substituents for R being —OH, —SR^4 or —OR^4, wherein R^4 is an alkyl group of 1 to 30 carbon or cycloalkyl group of 5 to 20 carbons;

R^1 and R^2 are independently H or an alkyl group of 1 to 4 carbons;

R^3 is an alkyl group of 1 to 24 carbons or a cycloalkyl group of 5 to 20 carbons;

R^5 is an alkyl group of 1 to 24 carbons;

R^6 is H or an alkyl group of 1 to 24 carbon, with the provisos that when m=0, R^6 is H or an alkyl group of 1 to 7 carbons and when m=1, R^6 is an alkyl group of 1 to 24 carbons;

R^7 is a direct bond or an alkylene group of 1 to 4 carbons; and

R^8 is a monocyclic, bicyclic or tricyclic cycloalkyl group of 5 to 16 carbons.

9. A composition as in claim **1**, further comprising an auxiliary antioxidant.

10. A composition as in claim **9**, wherein the auxiliary antioxidant is at least one phosphite, phenolic or arylamine antioxidant.

5,070,125

PRODUCTION OF POLYETHER POLYOLS WITH REDUCED UNSATURATION

Albert J. Heuvelsland, Heikant, Netherlands, assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 273,375, Nov. 18, 1988, Pat. No. 5,010,187. This application Jan. 8, 1991, Ser. No. 638,877

Int. Cl.[5] C08G *18/06*

U.S. Cl. 124—155 **1 Claim**

1. A polyurethane polymer prepared by the reaction of a polyisocyanate with a polyoxyalkylene polyol composition wherein said composition comprises

(a) a polyoxyalkylene polyol having an equivalent weight from about 200 to about 5,000 and an average functionality of about 2 to about 8, and

(b) from about 0.5 to about 20,000 ppm of a metal catalyst selected from the group consisting of barium, strontium and their oxides, hydroxides, hydrated hydroxides or monohydroxide salts, or mixtures thereof.

5,070,126

FILMS EASILY SOLUBLE IN COLD WATER

Shigekazu Toyonishi, and Takashi Nakajima, both of Sakai, Japan, assignors to Aicello Chemical Co., Ltd., Aichi, Japan

Continuation of Ser. No. 227,293, Aug. 2, 1988, abandoned. This application Dec. 21, 1990, Ser. No. 630,773

Int. Cl.[5] C08K *5/20*

U.S. Cl. 524—224 **7 Claims**

1. A film that is easily soluble in cold water, even under acid or alkaline conditions, comprising

a water-soluble copolymer consisting of 6 to 40 mol % of allyl ester moieties and 94 to 60 mol % of vinyl ester moieties, said copolymer having a degree of saponification of not less than 65% and

about 10% by weight of at least one plasticizer selected from the group consisting of glycerin, diethylene glycol, triethylene glycol, polyethylene glycol, polyglycerol, tetraethylene glycol, triethanolamine, 1,3-butanediol, triethanolamine acetate, and ethanol acetamide.

5,070,127

IMPACT MODIFIED POLYPHENYLENE SULFIDE

Andrew Auerbach, Livingston, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Continuation-in-part of Ser. No. 376,525, Jul. 7, 1989. This application Nov. 20, 1990, Ser. No. 615,859

Int. Cl.[5] C08K *5/54*

U.S. Cl. 524—262 **26 Claims**

1. An impact resistant polyarylene sulfide composition comprising: (a) polyarylene sulfide, (b) and an impact strength improving amount of a functionalized selectively hydrogenated block copolymer of the formula $B_n(AB)_oA_p$ where n=0 or 1, o=1–50, p=0 or 1, each A is predominantly a polymerized monoalkenyl aromatic or vinyl arene hydrocarbon block and each B prior to hydrogenation is predominantly a polymerized conjugated diene hydrocarbon block, to which block copolymer has been grafted at least one graftable functional molecule selected from the group consisting of an electrophilic graftable molecule containing a carboxyl functional group and an electrophile, wherein said electrophile is carbon dioxide, wherein substantially all of said electrophilic graftable molecules or electrophiles are grafted to the block copolymer in the monoalkenyl aromatic or vinyl arene block and said carboxyl functional groups are carboxylic acids, their salts or esters and (c) about 0.1 to 3 wt.% of the composition of an aminoalkoxysilane.

5,070,128

HEAT-STABILIZED/NON-YELLOWING CHLOROPOLYMERS

Michel Gay, Villeurbanne, France, assignor to Rhone-Poulenc Chimie, Courbevoie, France

Filed Apr. 4, 1990, Ser. No. 504,301

Claims priority, application France, Apr. 4, 1989, 89 04652

Int. Cl.[5] C08K *5/526, 5/15, 5/09*

U.S. Cl. 524—357 **21 Claims**

1. A composition of matter which comprises a chlorinated base polymer comprising a vinyl chloride monomer, a vinylidene chloride monomer a mixture thereof (a) an effective stabilizing amount of at least one organozinc compound, (b) an effective stabilizing amount of at least one organic calcium, barium, magnesium or strontium compound, and (c) an effective stabilizing amount of at least one sodium β-diketonate.

5,070,129

POLYOLEFIN COMPOSITION CONTAINING FLUOROPOLYMER

Fay W. Bailey, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 6, 1990, Ser. No. 475,559
Int. Cl.[5] C08K 5/09
U.S. Cl. 524—399 9 Claims

1. A polyolefin composition comprising:

(a) a polymer selected from the group consisting of an ethylene/hexene copolymer having a density within the range of 0.95 to 0.957 gm/cc and high density ethylene homopolymer;

(b) about 0.001 to 0.5 weight percent of a copolymer of vinylidene fluoride and hexafluoropropylene; and

(c) about 0.001 to 0.09 weight percent of at least one fatty acid salt based on the weight of the total composition.

5,070,130

ALKALINE EARTH OXIDES AND HYDROXIDES TO REDUCE NITROSAMINE FORMATION FROM VULCANIZATION ACCELERATORS

Dwight W. Chasar, Northfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sep. 19, 1990, Ser. No. 585,339
Int. Cl.[5] C08K 3/22, 5/39, 5/44
U.S. Cl. 524—430 23 Claims

1. A cured rubber composition having a reduced nitrosamine content, comprising;

the cured rubber composition made with a tertiary amine derived from a secondary amine accelerator and with from about 0.05 to about 0.95 parts by weight of an alkaline earth oxide or hydroxide per 100 parts by weight of a curable rubber;

wherein said acceleartor is selected from the group consisting of 2-(morpholinothio)benzothiazole, 2-(morpholinodithio)benzothiazole, N-oxydiethylenethiocarbamyl-N'-oxydiethylene suflenamide, N-oxydiethylenethiocarbamyl-N'-butylsulfenamide, tetramethylthiuramdisulfide, tetraethylthiuramdisulfide, tetramethylthiuramdisulfide, tetraethylthiuramdisulfide, tetramethylthiurammonosulfide, zinc dimethyldithiocarbamate, and dithiodimorpholine; and

wherein said alkaline earth oxide or hydroxide is calcium oxide, barium hydroxide, or calcium hydroxide.

5,070,131

GEAR OIL VISCOSITY INDEX IMPROVERS

Robert B. Rhodes, Houston, Tex.; Rudolf J. Eckert, Huffelsheim, Fed. Rep. of Germany, and Donald E. Loeffler, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Sep. 28, 1990, Ser. No. 590,417
Int. Cl.[5] C08K 5/01
U.S. Cl. 524—484 34 Claims

1. A gear oil composition having improved shear stability index essentially consisting of gear oil, a viscosity index improver comprising a hydrogenated star polymer comprising at least four arms, the arms comprising, before hydrogenation, polymerized conjugated diolefin monomer units and the arms having a number average molecular weight within the range of about 3,000 to about 15,000.

5,070,132

TWO-PACKAGE RTV ORGANOPOLYSILOXANES COMPRISING A WATER-RETAINING POLYMER

Pierre-Michael Peccoux, Lyons, and Gilbert Schorsch, Colombes, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Mar. 23, 1990, Ser. No. 497,663
Claims priority, application France, Mar. 23, 1989, 89 04113
Int. Cl.[5] C08K 3/36
U.S. Cl. 524—492 13 Claims

1. A two-component organopolysiloxane composition crosslinkable into elastomeric state, comprising:

(A) an α,ω-dihydroxypolydiorganosiloxane having a viscosity ranging from 50 to 1,000,000 mPa.s at 25° C.;

(B) an inorganic filler material;

(C) 0.05% to 0.5% by weight of the composition of water;

(D) a crosslinking agent which comprises (i) a silane of the formula $(R^2)_kSi(OR^1)_{4-k}$ in which the symbols R^1, which may be identical or different, are each a C_1–C_{12} alkyl radical, a halogenated C_1–C_{12} alkyl radical or a C_3–C_8 alkoxyalkylene radical, the symbol R^2 is a C_1–C_{10} hydrocarbon radical and the symbol k is zero or one, or (ii) a product of partial hydrolysis of the above silane (i);

(E) a catalytically effective amount of a crosslinking catalyst; and

(F) a hydroretaining amount of an alkali metal acrylate and/or methacrylate group polymer.

5,070,133

HIGH WATER-ABSORPTIVE RESIN EMULSION

Tooru Miyajima, Ebina, Japan, assignor to Kyoritsu Yuki Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 68,892, Jun. 30, 1987, abandoned. This application Jun. 20, 1990, Ser. No. 541,098
Int. Cl.[5] C08J 3/02
U.S. Cl. 524—501 7 Claims

1. A composition, comprising:

a highly water-absorptive resin emulsion in which fine particles of a highly water-absorptive resin are dispersed in an oil; said resin comprising a polymer of at least one acrylic ionic water soluble monomer, employed in an amount from 50 to 100% by weight of the total monomer, and acrylamide monomer, employed in an amount from 0 to 50% by weight of the total monomer, and having a crosslinking density of from 0.01 to 0.5 mol % based on total monomers; said fine particles each having a diameter of 3 μm or less.

5,070,134

VINYL ACETATE-ETHYLENE COPOLYMER EMULSION AND PROCESS FOR PRODUCING THE SAME

Takeo Oyamada; Yoshito Taira; Masayoshi Nitta; Yasuo Kaneshima; Tateshi Kurino, and Shizuo Narisawa, all of Chiba, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Feb. 28, 1990, Ser. No. 486,453
Claims priority, application Japan, Feb. 28, 1989, 1-49565; Dec. 13, 1989, 1-324797
Int. Cl.[5] C08L 29/04
U.S. Cl. 524—503 3 Claims

1. A vinyl acetate-ethylene copolymer emulsion comprising: a vinyl acetate copolymer composed of from 10 to 40% by weight of an ethylene unit and from 90 to 60% by weight of a vinyl acetate unit, said emulsion having a mean particle size of not larger than 0.9 μm and a solids content of from 65 to 75% by weight, an emulsifying dispersant in an amount of from 2.5 parts by weight or more but less than 5.0 parts by weight per 100 parts by weight of the vinyl acetate unit, wherein the emulsifying dispersant contains from 1.0 to 1.9 parts by weight of partially saponified polyvinyl alcohol prepared so as to have an average polymerization degree of from 300 to 1,000; and,

from 1.0 to 3.0 parts by weight of a polyoxyethylene nonionic surface active agent having an HLB of from 16.5 to 17.5 per 100 parts by weight of the vinyl acetate unit.

5,070,135

DISPERSION OF ACRYLATE AND METHACRYLATE ADDITION POLYMERS IN AN ORGANIC LIQUID

Roelof Buter, Dieren, Netherlands, assignor to Akzo N.V., Netherlands

Filed Apr. 13, 1989, Ser. No. 337,724

Claims priority, application Netherlands, Apr. 15, 1988, 8800977

Int. Cl.[5] C08L *51/00*

U.S. Cl. 524—504 26 Claims

1. A dispersion in an organic liquid of an addition polymer selected from the group consisting of an acrylate-based polymer, a methacrylate-based polymer and combinations thereof, wherein per 100 parts by weight of said addition polymer, said dispersion comprises 5–100 parts by weight of a stabilizer, said stabilizer comprising a graft copolymer composed of:

(1) 10–60 parts by weight of a polybutadiene built up from at least 60% by weight 1,3-butadiene, having grafted to it the following;

(2) 10–70 parts by weight of a first monomer mixture consisting essentially of

(a) 20–60 mole % of a styrene,

(b) 20–70 mole % of a hydroxyalkyl methacrylate having 2 to 6 carbon atoms in the alkyl group, and

(c) 0–40 mole % of a monoethylenically unsaturated compound different from that of (b) and;

(3) 0–60 parts by weight of a second monomer mixture consisting essentially of

(d) 20–60 mole % of a styrene,

(e) 30–80 mole % of a methacrylate selected from the group consisting of cycloalkyl methacrylates, alkyl methacrylates and combinations thereof, said cycloalkyl group or alkyl group having 1–12 carbon atoms and

(f) 0–40 mole % of a monoethylenically unsaturated compound different from that of (e),

wherein the total parts by weight of said polybutadiene, said first monomer mixture and said second monomer mixture is 100 and wherein said styrene is selected from the group consisting of styrene and methylstyrenes.

5,070,136

AQUEOUS POLYMER DISPERSIONS FOR COATING WOOD

Rolf Dersch, Frankenthal; Heinrich Dehne, Ludwigshafen; Roland Gellert, Neustadt; Dietrich-Wolfgang Mueller, Dossenheim; Johannes Vinke, Hockenheim, and Eckehardt Wistuba, Bad Duerkheim, all of Fed. Rep. of Germany, assignors to BASF Akteingesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 141,100, Jan. 5, 1988, abandoned. This application Mar. 26, 1991, Ser. No. 678,881

Claims priority, application Fed. Rep. of Germany, Jan. 10, 1987, 3700534

Int. Cl.[5] C08L *39/00*

U.S. Cl. 524—555 4 Claims

1. An aqueous copolymer dispersion in which the copolymer consists of:

a) from 85 to 98.5% by weight of methacrylates of C_1–C_{12}-monalcohols,

b) from 0.5 to 4% by weight of acrylic acid, methacrylic acid or mixtures thereof,

c) from 0.5 to 4% by weight of acrylamide, methacrylamide or mixtures thereof,

from 0.5 to 4% by weight of a diacrylate or a dimethacrylate of C_2–C_{24}-diols, a divinyl aromatic compound, a divinyl urea, a diallyl or triallyl compound or mixtures thereof, and

e) from 0 to 3% by weight of acrolein, methacrolein, diacetoneacrylamide, diacetonemethacrylamide, 2-butanonemethacrylates, vinyl acetoacetate or mixtures thereof.

5,070,137

PROCESS FOR THE PREPARATION OF POLYISOCYANATE

Mitsuo Kase, Chiba; Yoichi Kawasaki, Ichihara, and Noboru Okoshi, Sodegaura, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

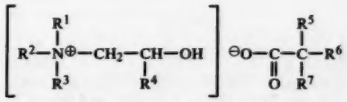
Filed Jul. 21, 1989, Ser. No. 382,876

Claims priority, application Japan, Jul. 22, 1988, 63-181512

Int. Cl.[5] C08L *75/00;* C08G *18/08;* C07D *487/12, 251/32*

U.S. Cl. 524—590 10 Claims

1. A process for preparing an isocyanurate-type polyisocyanate which comprises reacting an aliphatic or alicyclic diisocyanate compound comprising hexamethylene diisocyanate as a major component in the presence of an isocyanuration catalyst represented by general formula,



[I]

wherein R^1, R^2 and R^3 independently represent a hydrocarbon group containing 1 to 20 carbon atoms, or a hydrocarbon group containing one or more hetero atoms; or wherein R^1, R^2 and R^3 each represent a hydrocarbon group and two of R^1, R^2 and R^3 are linked to each other to form a piperidine or a morpholine ring; R^4 indicates a hydrogen atom or a hydrocarbon group containing 1 to 20 carbon atoms; and R^5, R^6 and R^7 independently represent a hydrocarbon group containing 1 to 20 carbon atoms.

5,070,138

POLYURETHANE ELASTOMER TIRE FILL COMPOSITIONS AND METHOD OF MAKING SAME

John W. Bulluck, Richmond, Va., assignor to E. R. Carpenter Company, Inc., Richmond, Va.

Filed Jul. 13, 1990, Ser. No. 552,408

Int. Cl.[5] C08L *75/04*

U.S. Cl. 524—871 7 Claims

1. A method of making a polyurethane elastomer composition having excellent physical and thermal properties and suitable for use as a filling material for a vehicle tire, comprising reacting.

a) a mixture of a low functionality 4,4'-diphenylmethane diisocyanate or a modified 4,4'-diphenylmethane diisocyanate and a nonreactive diluent, wherein said low functionality is from about 2 to about 2.3, and

b) A mixture consisting essentially of

hydroxyl group terminated polyfunctional polyether and added water in an amount of less than 0.2% by volume of said mixture b), and

curing the reaction product which is formed.

5,070,139

2,4-DISUBSTITUTED 1,3-DIOXOLANES

Javier Bartroli; Manuel Anquita, and Elena Carceller, all of Barcelona, Spain, assignors to J. Uriach & Cia. S.A., Barcelona, Spain

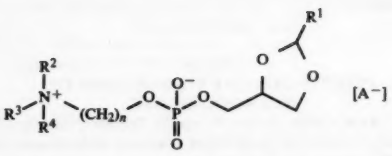
Division of Ser. No. 257,092, Oct. 13, 1988, Pat. No. 4,940,706. This application Apr. 27, 1990, Ser. No. 515,379

Claims priority, application Spain, Oct. 13, 1987, 8702901

Int. Cl.[5] C07F *9/06;* A61K *31/685*

U.S. Cl. 549—221 3 Claims

1. 2,4-Disubstituted 1,3-dioxolanes of formula



I

wherein:

R^1 represents a linear or branched alkyl, alkenyl or alkynyl group, of 10 to 24 carbon atoms;

n is an integer 2 to 10; and

R^2, R^3, and R^4 are lower alkyl groups (with the proviso that when R^1 is n—$C_{15}H_{29}$, n—$C_{17}H_{33}$, then R^2, R^3, and R^4 are not simultaneously all methyl) or $R^2R^3R^4N^+$ represents an aromatic cyclic ammonium group selected from the group consisting of thiazolium, benzothiazolium, oxazolium, pyridinium, quinolinium or isoquinolinium.

5,070,140

COPOLYMERS OF VINYL ACETATE AND ALLYL GLYCIDYL ETHER CAPPED C_{12}–C_{30} ALIPHATIC ALCOHOLS AND THEIR SAPONIFIED PRODUCTS

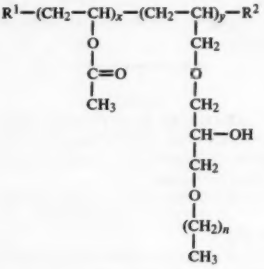
Eric Lind, Canton; Pauls Davis, Gibraltar, and Steven D. Gagnon, Detroit, all of Mich., assignors to BASF Corporation, Wyandotte, Mich.

Filed Dec. 22, 1989, Ser. No. 455,716

Int. Cl.[5] C08F *16/06, 218/02*

U.S. Cl. 525—60 **25 Claims**

1. A copolymer having the general formula:



wherein

R^1 and R^2 are end groups, and

x is equal to or greater than y, and

n is a number ranging from about 11 to about 29 wherein the molecular weight of said copolymer is from about 500 to about 5000.

5,070,141

POLYACRYLATE GRAFT-POLYOL DISPERSANTS

Robert G. Gastinger, West Chester, Pa., and John E. Hayes, Wilmington, Del., assignors to ARCO Chemical Technology, Inc., Wilmington, Del.

Filed Jul. 29, 1988, Ser. No. 226,329

The portion of the term of this patent subsequent to Jun. 4, 2008, has been disclaimed.

Int. Cl.[5] C08L *51/08, 33/08*

U.S. Cl. 525—63 **36 Claims**

1. Stable, low viscosity polymer polyols made by a process comprising polymerizing, via a free-radical reaction, a vinyl monomer component, in the presence of a polyol mixture comprising a major portion of a base polyol and a minor portion of a polyacrylate graft-polyol as a dispersant, where the polyacrylate graft-polyol dispersant is made by polymerizing at least one acrylate monomer in the presence of a polyol in which the resulting polymer from the acrylate monomer is soluble, and where the polyacrylate graft-polyol dispersant is employed in an amount within the range of from about 0.1 to about 20 weight percent based on the total weight of the vinyl monomer and the polyol mixture.

5,070,142

POLYETHERIMIDE-ASA BLENDS

Harold F. Giles, Jr., Cheshire, and William R. Schlich, Pittsfield, both of Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 31, 1986, Ser. No. 948,069

Int. Cl.[5] C08L *79/08*

U.S. Cl. 525—66 **10 Claims**

1. A polymeric blend comprising (a) a polyetherimide and (b) (meth)acrylate-styrene-acrylonitile polymer wherein said polymer is from about 5% to about 50% by weight crosslinked (meth)acrylate component, from about 5% to about 35% by weight of a crosslinked styrene-acrylonitile component and from about 15% to about 90% by weight uncrosslinked styrene-acrylonitile component.

5,070,143

ADHESIVE BLEND OF POLYOLEFINS AND GRAFTED BLOCK COPOLYMER OF POLYSTYRENE

Mark S. Pucci, Elk Grove Village; Mitsu Shida, Barrington; John Machonis, Jr., Schaumburg, and Kevin Jachec, Highwood, all of Ill., assignors to Morton International, Inc., Chicago, Ill.

Filed Mar. 9, 1989, Ser. No. 321,485

Int. Cl.[5] C08L *23/06, 23/08, 23/12, 53/02*

U.S. Cl. 525—74 **14 Claims**

1. An adhesive composition consisting of a mixture of:

A. from about 30% to about 99.9% by weight of a polyolefin base resin selected from the group consisting of polypropylene; polyethylene; and compolymers of ethylene with vinyl acetate, vinyl alcohol, methyl acrylate, methylmethacrylate, ethyl acrylate, and ethyl methacrylate;

B. from about 0.1% to about 50% by weight of a graft polymerized block copolymer having polystyrene end blocks and at least one polymer of an olefin, diolefin, or mixture thereof or a hydrogenated polymer thereof as a middle block, graft polymerized by treatment with at least one monomer selected from carboxylic acids, their anhydrides, and mixtures thereof;

C. from 0 to about 30% by weight of a nonelastomeric second polyolefin made from different monomers from those of said polyolefin base resin; and

optional fillers, adhesion promoters and antioxidants.

5,070,144

REACTIVE COMPATIBILIZATION OF POLYACETAL AND POLYPROPYLENE BLENDS

Paul N. Chen, Sr., Gillette; Alex Forschirm, Parsippany; Morton Glick, Summit, and Michael Jaffe, Maplewood, all of N.J., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Dec. 5, 1990, Ser. No. 622,430

Int. Cl.[5] C08G *63/48, 63/91;* **C08L** *51/00, 61/00*

U.S. Cl. 525—154 **5 Claims**

1. A polymer blend comprising:

a polyacetal;

polypropylene;

a hydroxylated polyacetal; and,

muconic acid-grafted polypropylene,

wherein said polyacetal and polypropylene together comprise at least about 50% by weight of said blend.

5,070,145

MULTI-PHASE THERMOPLASTIC COMPOSITIONS AND ARTICLES OBTAINED THEREFROM

Lionel Guerdoux, Lillebonne, France, assignor to Societe Chimique Des Charbonnages S.A., Cedex, France

Continuation of Ser. No. 112,036, Oct. 23, 1987, abandoned, which is a continuation-in-part of Ser. No. 938,246, Dec. 5, 1986, abandoned. This application Dec. 5, 1989, Ser. No. 445,935
Claims priority, application France, Apr. 23, 1985, 85 06105
Int. Cl.[5] C08L 77/00
U.S. Cl. 525—179 7 Claims

1. A composition comprising from 50 to 95% by weight of at least one polyamide resin and from 5 to 50% by weight of a polymer composition comprising from 84 to 99.1 mole % of units derived from ethylene and from 0.9 to 16 mole % of units derived from an unsaturated anhydride of a dicarboxylic acid and from at least one alkyl acrylate or methacrylate wherein the alkyl group has 1 to 8 carbon atoms, the polymer composition being present in the form of a mixture of:

(A) an ethylene homopolymer or an ethylene copolymer comprising ethylene and 20 mole % or less of units derived from alkyl acrylate or methacrylate wherein the alkyl group has 1 to 8 carbon atoms, the homopolymer and the copolymer having a melt index between 1 and 50 dg/min; and

(B) a terpolymer of (i) ethylene, (ii) 0.3 to 2 mole % maleic anhydride, and (iii) 0.3 to 3 mole % of units derived from an alkyl acrylate or methacrylate wherein the alkyl group has 1 to 8 carbon atoms, the terpolymer having a melt index between 1 and 50 dg/min., the weight ratio (A) to (B) being between 1 to 6 and 6 to 1.

5,070,146

RUBBER COMPOSITIONS CONTAINING POLYMERIC ACTIVATORS

Aubert Y. Coran, Akron, Ohio, and Leonard H. Davis, Chicago, Ill., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 205,968, Jun. 13, 1988. This application Jul. 18, 1989, Ser. No. 381,227
The portion of the term of this patent subsequent to Jul. 30, 2008, has been disclaimed.
Int. Cl.[5] C08L 7/00, 9/00
U.S. Cl. 525—192 10 Claims

1. A rubber composition comprising butadiene polymer rubber, sulfur and a vulcanization accelerator, and from 0.5 to 2.0 parts by weight, per 100 parts by weight of the rubber of a cure activator, which activator is an interpolymer of a vinylpyridine monomer and a diene hydrocarbon co-monomer in which the interpolymer contains from 30% to 55% by weight of vinylpyridine units.

5,070,147

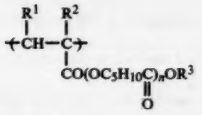
GRAFT COPOLYMERS EFFECTIVE AS ADDITIVES TO UNSATURATED POLYESTER RESINS

Tatsuhiko Ozaki, 6-74 Eiraku-cho, Nishio, Aichi; Hirotaka Wada, 2-5, Minato-machi, Gamagori, Aichi, and Fumitoshi Sugiura, 26-5 Sakuma, Takenoya-cho, Gamagori, Aichi, all of Japan

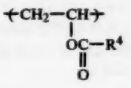
Filed Aug. 30, 1989, Ser. No. 400,479
Claims priority, application Japan, Sep. 17, 1988, 63-233262
Int. Cl.[5] C08G 63/08; C08F 283/14
U.S. Cl. 525—285 12 Claims

1. A graft copolymer effective as an additive to unsaturated polyester resins, said graft copolymer comprising

10–80 weight % of repeating units of a first macromonomer constituent given by



20–89.9 weight % of repeating units of a second monomer constituent given by



0.1–5 weight % of a third constituent which is a vinyl monomer unit having a carboxylic group or an acid anhydride group, and

0–40 weight % of a fourth constituent which is vinyl monomer unit selected from vinyl chloride unit, styrene unit, alkyl vinyl ether unit with 1–6 carbon atoms, phenyl vinyl ether unit and vinyl benzoate unit, where R^1 is CH_3; R^2 is H; R^3 is $-C_mH_{2m}O)_1R^6$, R^6 being a hydrocarbon group with 1–18 carbon atoms, m being 2–3, and r being 1–5; R^4 is an alkyl group with 1–3 carbon atoms; and n is 5–90.

5,070,148

SEGMENTED ELASTOMER

Wen-Liang Hsu, Copley, and Adel F. Halasa, Bath, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 16, 1990, Ser. No. 466,087
Int. Cl.[5] C08F 255/06, 279/00
U.S. Cl. 525—316 20 Claims

1. A rubber polymer which has an excellent combination of properties for use in making tire treads which is comprised of: (a) a first segment which is comprised of repeat units which are derived from isoprene having a microstructure wherein there are from about 75% to about 98% 1,4-linkages and from about 2% to about 25% 3,4-linkages and wherein the first segment has a number average molecular weight which is within the range of about 25,000 to about 350,000; and (b) a second segment which is comprised of repeat units which are derived from 30 to 95 weight percent 1,3-butadiene and from 5 to 70 weight percent styrene, wherein the sum of (1) the product of 1.7 and the weight percent of styrene in the second segment and (2) the percentage of 1,2-butadiene linkages in the second segment is within the range of about 50% to about 92%, wherein the second segment has a number average molecular weight which is within the range of about 50,000 to about 350,000 and wherein the ratio of the number average molecular weight of the first segment to the number average molecular weight of the second segment is within the range of about 25:75 to about 75:25.

5,070,149

CATIONIC RESIN COMPOSITION WITH REDUCED EMISSIONS DURING BAKING

Tapan K. DeBroy, Utica, and Ding Y. Chung, Rochester Hills, both of Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 9, 1990, Ser. No. 509,412
Int. Cl.[5] C08F 265/10
U.S. Cl. 525—296 9 Claims

1. In a resin composition for use as the film forming component for cationic electrodepositing paints, the resin composition comprising the reaction product of

(A) a basic polyepoxide/amine adduct resin containing amino groups and hydroxyl groups capable of reacting with isocyanate groups, with

(B) a blocked polyisocyanate crosslinker; wherein the improvement comprises:

the blocked polyisocyante crosslinker is the reaction product of

(i) polyether polyol modified methylene diphenyl diisocyanate; and

(ii) a mixture of blocking agents consisting essentially of

(a) an alcohol with a molecular weight of less than 75, or a mixture of such alcohols; and

(b) a glycol ether alcohol with a molecular weight of 118 or above, or a mixture of such glycol ether alcohols; wherein the molar ratio of the alcohol with a molecular weight of less than 75 or mixture of such alcohols to the glycol ether alcohol with a molecular weight of 118 or above or mixture of such glycol ether alcohols is 9.0:1.0 to 1.0:2.0.

5,070,150

PROCESS FOR THE SOLID STATE (SOLVENTLESS) HYDROXYLATION OF VINYL-CONTAINING RUBBERS USING A HYDROXYMERCAPTAN

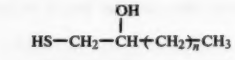
Roger J. Hopper, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jul. 2, 1990, Ser. No. 548,326

Int. Cl.[5] C08F *19/20*

U.S. Cl. 525—350 **11 Claims**

1. A process for solventless hydroxylation of vinyl-containing rubber comprising reacting (a) a vinyl-containing rubber having from about 5 to about 75 percent of a 1,2-double bond content with (b) a mercaptan of the formula



wherein n is an integer of from 3 to 19; and wherein the reaction is conducted in the absence of a solvent at a temperature ranging from 60° C. to about 165° C. and catalyzed by a free radical catalyst.

5,070,151

RESIN COMPOSITION

Yukio Mizuno, Ehime; Takashi Maruyama, Ibaraki, and Shinichi Yachigo, Osaka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Division of Ser. No. 510,216, Apr. 18, 1990, Pat. No. 5,017,663. This application Feb. 14, 1991, Ser. No. 655,338

Claims priority, application Japan, Apr. 18, 1989, 1-99732

Int. Cl.[5] C08L *71/12, 77/00*

U.S. Cl. 525—397 **9 Claims**

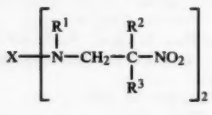
1. A resin composition which comprises:

100 parts by weight of a composition comprising

(A) 5–95% by weight of a polyphenylene ether resin, and

(B) 95–5% by weight of a polyamide and

0.01–10 parts by weight, based on said composition comprising (A) and (B), of (D) a compound comprising a dinitrodiamine represented by the formula (I):



(I)

where X represents a divalent chain aliphatic, cycloaliphatic or aromatic group which may contain halogen or oxygen, R′ represents a hydrogen atom, a chain aliphatic group, a cycloaliphatic group or an aromatic group and when C and R1 are both chain aliphatic groups, the nitrogen atoms may further link to each other through R^1; R^2 and R^3 each independently represents a hydrogen atom or an alkyl group of 1–12 carbon atoms and R2 and R^3 may link to each other to form a ring; and

(C) a rubber-like polymer in an amount of at most 100 parts by weight based on 100 parts by weight of the composition comprising (A) and (B).

5,070,152

USE OF PHOSPHOROUSTRISLACTAMS AS COMPATIBILIZING AGENTS FOR POLYPHENYLENE OXIDE/POLYESTER BLENDS

Jeffrey H. Glans, Somerville, and Murali K. Akkapeddi, Morristown, both of N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Division of Ser. No. 562,355, Aug. 3, 1990. This application Mar. 28, 1991, Ser. No. 676,666

Int. Cl.[5] C08L *67/02, 69/00, 71/12*

U.S. Cl. 525—397 **9 Claims**

1. A composition comprising:

a polycarbonate;

a poly(phenylene ether);

a polyester; and

a phosphoroustrislactam.

5,070,153

MOLDED POLYBENZIMIDAZOLE/POLYARYLENEKETONE ARTICLES AND METHOD OF MANUFACTURE

Edwardo Alvarez; Lorenzo P. DiSano, both of Houston, Tex., and Bennett C. Ward, Charlotte, N.C., assignors to Hoechst Celanese Corporation, Charlotte, N.C.

Filed Apr. 13, 1989, Ser. No. 340,118

The portion of the term of this patent subsequent to Mar. 27, 2007, has been disclaimed.

Int. Cl.[5] G08L *49/06*

U.S. Cl. 525—420 **6 Claims**

1. An injection molded article having improved thermal resistance and strength formed from a homogeneous mixture comprising from about 5 to 75 percent by weight polybenzimidazole and from about 95 to 25 percent by weight of a polyaryleneketone.

5,070,154

COMPOSITION OF MALEIMIDE AND AROMATIC-DOUBLE BOND EPOXY RESIN

Toshio Shiobara, and Hisashi Simizu, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Sep. 11, 1990, Ser. No. 580,647

Claims priority, application Japan, Sep. 11, 1989, 1-235306

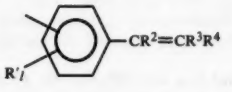
Int. Cl.[5] C08L *63/04, 63/10, 79/08*

U.S. Cl. 525—422 **13 Claims**

1. A thermosetting resin composition comprising in an admixture,

(a) a maleimide compound having in the molecule thereof, at least one N-substituted maleimide group and

(b) an epoxy novolak resin having a double bond conjugated with an aromatic ring synthesized from epichlorohydrin and a novolak resin, said double bond conjugated with an aromatic ring represented by the following formula:



wherein R′ is selected from the group consisting of a hydrogen atom, a halogen atom, a halogen-substituted or unsubstituted alkyl group having 1 to 6 carbon atoms, and a glycidoxy group, R^2, R^3 and R^4 are independently selected from a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, and l is an integer of 1 to 3.

5,070,155

SEMI-AROMATIC COPOLYAMIDE OR COPOLYESTER-AMIDE PREPARED FROM ALIPHATIC POLYAMIDE

Ming-de Liu, Jinan-Shandong, China; Bruno Bresci, Livorno, Italy; Pier L. Magagnini, Riglione, Italy; Nicoletta Maurizi, Ancona, Italy; Ugo Pedretti, Milan, Italy, and Arnaldo Roggero, San Donato Milanese, Italy, assignors to Eniricerche, S.p.A., Milan, Italy

Filed Dec. 1, 1989, Ser. No. 444,824

Claims priority, application Italy, Dec. 2, 1988, 22831 A/88

Int. Cl.[5] C08G *69/48*

U.S. Cl. 525—432 **18 Claims**

1. Process for preparing semi-aromatic copolyamides or copolyester-amides, wherein

(a) an aliphatic polyamide;

(b) an aromatic amino acid; with or without

(c) a stoichiometrically equivalent mixture of a diacid selected from the group consisting of the aliphatic diacids containing from 6 to 10 carbon atoms, terephthalic acid, and 4,4'-dihydroxy-biphenyl;

are reacted in the presence or absence of a catalyst, under melting conditions, with a maximum temperature of the order of 300° C., with a ratio of the (a) monomer units contained in the aliphatic polyamide to the moles of the (b) component comprised within the range of from 20:1 up to 1:1, and with a molar ratio of the (c) component to the (b) component comprised within the range of from 0:1 to 0.5:1.

5,070,156

PULVERULENT POLYAMIDE MIXTURE COATING COMPOSITION WHEREIN THE POLYAMIDE HAS AS AN AVERAGE AT LEAST NINE CARBON ATOMS PER CARBONAMIDE GROUP

Rainer Feldmann, Marl, and Günter Hess, Haltern, both of Fed. Rep. of Germany, assignors to Huls AG, Marl, Fed. Rep. of Germany

Division of Ser. No. 781,599, Sep. 30, 1985, Pat. No. 4,661,585. This application Sep. 29, 1986, Ser. No. 912,121

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1984, 3441708

The portion of the term of this patent subsequent to Nov. 3, 2006, has been disclaimed.

Int. Cl.[5] C08L *77/02*

U.S. Cl. 525—432 **12 Claims**

1. A pulverulent polyamide coating composition consisting essentially of an intimate mixture of:

(I) 80 to 20% by weight of a first polyamide having on the average at least nine aliphatically bound carbon atoms per carbonamide group and having a relative viscosity measured in m-cresol at 25° C. and a concentration of 0.5 g/l of 1.50 to 1.65; and

(II) 20 to 80% by weight of a second polyamide having on the average at least nine aliphatically bound carbon atoms per carbonamide group and having a relative viscosity measured in m-cresol at 25° C. and a concentration of 0.5 g/l of 1.55 to 1.75, wherein the component (II) has a relative viscosity at least 0.04 and at most 0.1 units greater than component (I).

5,070,157

SELF REINFORCED COMPOSITE OF THERMOTROPIC LIQUID CRYSTAL POLYMERS

Avraam I. Isayev, and Pazampalaco R. Subramanian, both of Akron, Ohio, assignors to University of Akron, Akron, Ohio

Filed Aug. 16, 1990, Ser. No. 568,601

Int. Cl.[5] C08L *67/03*

U.S. Cl. 525—444 **16 Claims**

1. A blend of thermotropic liquid crystal polymers,

said liquid crystal polymers having overlapping melt processing temperature ranges;

each of said liquid crystal polymers being a wholly aromatic polyester, at least two of said liquid crystal polymers being phase separated in the solid state;

said blend having a matrix phase and a fiber reinforcing phase which is formed in situ under high strain melt processing conditions;

said blend containing a maximum of 98 percent by weight of any one liquid crystal polymer and conversely at least 2 percent combined weight of all other liquid crystal polymers present, based on total weight of liquid crystal polymers in said blend;

said blend having greater tensile strength at break and higher impact strength than those of any constituent liquid crystal polymer in pure form.

5,070,158

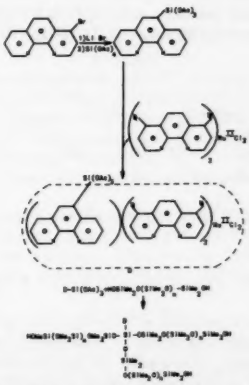
COVALENTLY LABELED SILOXANE POLYMERS

Robert R. Holloway, Montara, and Teddy T. Kiang, Sunnyvale, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 24,940, Mar. 12, 1987, abandoned. This application Nov. 22, 1988, Ser. No. 274,626

Int. Cl.[5] C08G *77/22*

U.S. Cl. 525—475 **7 Claims**



1. A method to derivatize silicone polymers by incorporating therein heavy metal ion polycyclic-aromatic salts, which comprises:

reacting silanol-terminated single-chain dialkyl siloxane polymers with a cross-linker of the formula $D—SiX_3$ wherein D is a heavy metal ion polycyclic-aromatic salt, and X is a leaving group.

5,070,159

ADDITION COMPOUNDS, A PROCESS FOR THE PREPARATION, AND THEIR USE, BASED ON EPOXY NOVOLAC-FATTY AMINE ADDUCTS

Erwin Dietz, Kelkheim; Andreas Sommer, Niedernhausen; Adolf Kroh, Selters; Jürgen Hohn, Kelkheim; Otmar Hafner, Glashütten, and Wolfgang Rieper, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

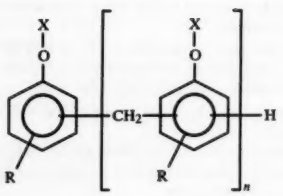
Continuation of Ser. No. 71,364, Jul. 9, 1987, abandoned. This application Jun. 16, 1989, Ser. No. 368,121

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1986, 3623296; Jul. 11, 1986, 3623297

Int. Cl.[5] C08G *59/50*

U.S. Cl. 525—504 **15 Claims**

1. A process for the preparation of an addition compound, which process comprises reacting at least one polyepoxide of the idealized formula (I)



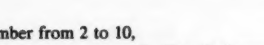
(I)

in which

n is a number from 2 to 10,

R is a hydrogen atom or a C_1–C_{24}-alkyl group, and

X is the 2,3-epoxypropyl radical, with an amine or several amines of the formula (II)



(II)

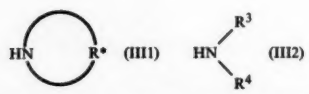
in which

p is an integer from 0 to 2;

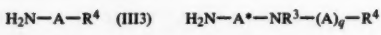
R^1 is a saturated or unsaturated aliphatic alkyl radical having 8 to 24 carbon atoms and

R^2 is a C_1–C_{12}-alkylene group,

and with at least one amine selected from the group consisting of the amines of the formulae (III1), (III2), (III3) and (III4)



(III1) (III2)



(III3) (III4)

in which

R*, together with the nitrogen atom, is a heterocyclic ring system,

R^3 is a hydrogen atom or a C_1–C_{24}-alkyl group, and

R^4 represents a saturated or unsaturated, mononuclear or polynuclear, carbocyclic or heterocyclic ring system having 2 to 22 carbon atoms or represents two or more of the said ring systems, which are linked to one another through a member of the formula —CH_2—, —O—, —S—, —CO—, —SO—, —SO_2—, —NH— or a combination of the above members, the ring systems or the group of linked ring systems mentioned being unsubstituted or substituted by one or more of the radicals —R^5, halogen, —OR^5, —$COOR^5$—, —$CONR^5R^6$, —NR^5COR^6, —CN, —CF_3or —NO_2, where R^5 and R^6, independently of one another, are H or C_1–C_{24}-alkyl; or represent a radical of the formula —R^{12}—OR^{13}, in which R^{12} is an alkylene group having 2 to 30 carbon atoms or is a C_2–C_{30}-alkylene group interrupted by —O— or —NR^{13}— or both, and the radicals R^{13} independently of each other are H or a C_1–C_{24}-alkyl group,

A is a C_1–C_{30}-alkylene group,

A* is a C_1–C_{12}-alkylene group, and

q is 0 or 1,

in an amount ratio such that 1 to 99% of the epoxy groups of the polyepoxide of the formula (I) are reacted with the amine or amines of the formula (II) and 99 to 1% of the epoxy groups are reacted with the amine or amines selected from the group consisting of amines of the formulae (III1) to (III4), wherein the ratio of the number of epoxy groups to the total number of amine molecules of the formulae (II) and (III1) to (III4) in the reaction is 1:0.8 to 1:1, and the product obtained is if desired, reacted with an acid.

5,070,160

PROCESS FOR DRYING ALUMINOXANE AND PROCESS FOR PRODUCING POLYMERS

Norio Tomotsu; Hiroshi Maezawa, and Koji Yamamoto, all of Ichihara, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1990, Ser. No. 514,420

Claims priority, application Japan, May 25, 1989, 1-130253

Int. Cl.[5] C08F *4/642*

U.S. Cl. 526—165 **11 Claims**

1. A process for drying aluminoxane, which comprises drying a viscous solution containing aluminoxane, while applying a sufficient shearing force to keep said viscous solution in a polydispersive state, so as to make a dispersion of dry particulate aluminoxane.

5,070,161

HEAT-LATENT, CATIONIC POLYMERIZATION INITIATOR AND RESIN COMPOSITIONS CONTAINING SAME

Shinji Nakano, Takatsuki; Hiroharu Ohsugi, Hirakata; Yasuhiko Nakae, Sakai; Hisaki Tanabe, Yawata; Ryozo Takagawa, Toyonaka; Yoshio Eguchi, Ikeda; Koichi Tsutsui, Tanabecho, and Takeshi Endo, Yokohama, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

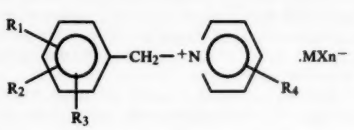
Filed May 25, 1989, Ser. No. 356,903

Claims priority, application Japan, May 27, 1988, 63-131170; May 27, 1988, 63-131171; Dec. 28, 1988, 63-333802; Mar. 3, 1989, 1-526731; Mar. 29, 1989, 1-794681; Apr. 25, 1989, 1-106738

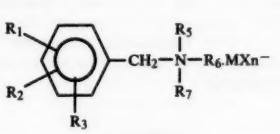
Int. Cl.[5] C08F *4/20*

U.S. Cl. 526—193 **3 Claims**

1. In a heat curable resinous composition comprising a polymerization initiator and a resin capable of curing upon heating in the presence thereof, the improvement wherein the polymerization initiator is 0.01 to 10% by weight of the solid content of said resin of a compound of the formula:



(I-a)



(I-b)

wherein R_1, R_2, R_3 and R_4 are each H, OH, halogen, an alkyl, an alkoxy, nitro, amino, an alkylamino, an alkanoyl, cyano, an alkoxycarbonyl or carbamoyl;

R_5, R_6 and R_7 are each an alkyl, an alkenyl or phenyl which may be substituted with nitro, cyano, amino, halogen, an alkyl, an alkoxy or a dialkylamino, at least one of R_5, R_6 and R_7 being phenyl or the substituted phenyl;

M is As, Sb, B or P;

X is halogen; and

m equals the valency of the element M plus one.

5,070,162

COPOLYMERIZATION OF VINYL ACETATE AND A FLUOROMONOMER IN AN AQUEOUS MEDIUM

Bryce C. Oxenrider, Florham Park, N.J.; David J. Long, Amherst, N.Y., and Frank Mares, Whippany, N.J., assignors to Allied-Signal Inc., Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 123,480, Nov. 20, 1987, abandoned. This application Oct. 20, 1989, Ser. No. 424,441

Int. Cl.[5] C08F *2/00, 14/18*

U.S. Cl. 526—216 25 Claims

1. A method of copolymerizing a vinyl monomer selected from the group consisting of vinyl acetate, vinyl propionate and vinyl trifluoro acetate and a fluoromonomer selected from the group consisting of tetrafluoroethylene and trifluoroethylene to form a copolymer having an alternating or substantially alternating distribution of monomeric units derived from said vinyl monomer and said fluoromonomer in the polymeric backbone, said method comprising:

copolymerizing the vinyl monomer and the fluoromonomer in an aqueous reaction medium consisting essentially of water and acetic acid in the absence or in the substantial absence of a distinct acetic acid phase in the reaction mixture and in the presence of an initiator, and maintaining the molar ratio of vinyl monomer to fluoromonomer dissolved in the reaction medium constant or substantially constant during said co-polymerizing to form a copolymer having an alternating or substantially alternating distribution of monomeric units derived from said vinyl monomer and said fluoromonomer in said copolymeric backbone.

5,070,163

BISMIDES OF ALLYL- OR METHALLYLBICYCLO(2.2.1)HEPT-5-ENE-2,3-DICARBOXYLIC ACID

Friedrich Stockinger, Courtepin, and Andreas Kramer, Düdingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Aug. 31, 1989, Ser. No. 401,350

Claims priority, application Switzerland, Sep. 2, 1988, 3281/88

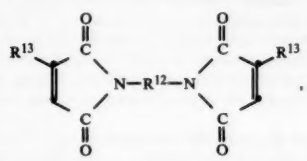
Int. Cl.[5] C08F *26/06;* C07D *209/48*

U.S. Cl. 526—259 18 Claims

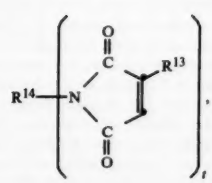
13. A composition containing

A) at least one compound of the formula I according to claim 1 and

B) at least one compound of the formulae VIII or IX



(VIII)



(IX)

in which t is an integer from 3 to 12, R^{12} is alkylene, cycloalkylene, arylene, aralkylene or a divalent heterocyclic radical containing one or two N, O or S atoms, R^{13} is methyl or hydrogen and R^{14} is a t-valent radical of an aromatic polyamine after the removal of t amino groups.

5,070,164

COLD SEALABLE COHESIVE TERPOLYMERS

Taeik Min, Pittsford, and Robert E. Touhsaent, Fairport, both of N.Y., assignors to Mobil Oil Corporation, Fairfax, Va.

Division of Ser. No. 187,303, Apr. 28, 1988, Pat. No. 4,898,787, which is a continuation-in-part of Ser. No. 69,049, Jul. 2, 1987, abandoned. This application Aug. 31, 1989, Ser. No. 401,596

Int. Cl.[5] C08F *12/30*

U.S. Cl. 526—286 10 Claims

1. A crosslinked, cold sealable, emulsion polymerized cohesive terpolymer for cold sealable packaging, comprising less than about 0.5% by weight of a crosslinking agent, the terpolymer is made from:

(a) about 60 to about 70 percent by weight of a first monomer selected from the group consisting of ethyl acrylate, hexyl acrylate, isooctyl acrylate, butyl acrylate, methyl acrylate and vinylidene chloride;

(b) about 25 to about 35 percent by weight of a second monomer selected from the group consisting of vinyl acetate, methyl methacrylate, styrene, ethyl methacrylate, and isobutyl methacrylate; and

(c) about 1 to about 5 percent by weight of a third monomer selected from the group consisting of methacrylic acid, sulfoethyl methacrylate, acrylic acid, itaconic acid, and maleic acid, whereby said terpolymer has low tack characteristics, high crimp strength and is cohesive only to similarly coated substrates when cold sealed under pressure.

5,070,165

UREA-CONTAINING (METH)ACRYLIC ACID DERIVATIVES OF TRIISOCYANATES-COMPOSITIONS FOR AN ARTIFICIAL TOOTH

Michael Müller, Bergisch-Gladbach; Wolfgang Podszun, and Jens Winkel, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

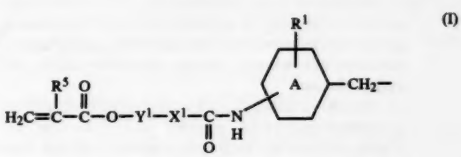
Division of Ser. No. 620,228, Nov. 20, 1990, which is a division of Ser. No. 517,261, May 1, 1990, Pat. No. 5,008,436. This application Mar. 1, 1991, Ser. No. 662,700

Claims priority, application Fed. Rep. of Germany, May 27, 1989, 3917320

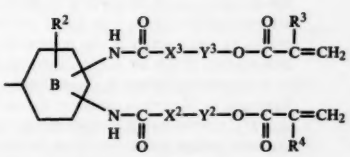
Int. Cl.[5] C08F *226/02*

U.S. Cl. 526—301 9 Claims

1. An artificial tooth formed of a composition comprising a (meth)acrylic acid derivative of a triisocyanate of the formula



(I)



wherein

R^1 and R^2 are identical or different and stand for hydrogen or a lower alkyl radical,

R^3, R^4 and R^5 are identical or different and denote hydrogen or methyl,

Y^1 to Y^3 are identical or different and denote divalent straight-chain or branched hydrocarbon radicals of 2 to 15 carbon atoms which may optionally include 1 to 3 oxygen

bridges and which may be unsubstituted or substituted by 1 to 4 additional (meth)acryloyloxy radicals,

X^1 to X^3 are identical or different and denote —NR^1— or —O—, at least one of the radicals X^1 to X^3 denoting —NR^1—, and the rings

A and B are identical or different and may be aromatic or saturated.

5,070,166

WETTABLE, FLEXIBLE, OXYGEN PERMEABLE, CONTACT LENS CONTAINING POLYOXYALKYLENE BACKBONE UNITS, AND USE THEREOF

Kai C. Su, 13090 Hopewell Rd., Alpharetta, Ga. 30201, and Frank Molock, 1535 Summer Hollow Trail, Lawrenceville, Ga. 30245

Continuation of Ser. No. 315,225, Feb. 23, 1989, abandoned, which is a continuation of Ser. No. 160,622, Feb. 26, 1988, abandoned. This application Oct. 2, 1989, Ser. No. 418,687

Int. Cl.[5] C08F *26/02*; C08L *71/02*; G01B *1/04*

U.S. Cl. 526—301 **14 Claims**

1. A wettable, flexible, oxygen permeable, crosslinked polymer which is the polymerization product of a monomer of formula III

L'-D-[A-L-D]$_w$-A-L'' (III)

wherein

w is 0–8,

L' is hydrogen, P'-B-R-B'- or P'-R-B'- in which the carbonyl group of B is bound to P',

P' is hydrogen, amino, hydroxyl or a moiety containing a crosslinkable group when may be crosslinked when coreacted with a suitable crosslinking agent or when irradiated with actinic radiation;

L'' is hydrogen, -B-R-B'-P' or -B-R-P' wherein the carbonyl of B' is bound to P'; or L'' is a terminal monovalent aliphatic, aromatic or cycloaliphatic group of up to 14 carbon atoms;

each D is —O— or —NR_7— in which R_7 is hydrogen, lower alkyl or phenyl;

each L is independently -B-R-B'-, -B-R- or -R-B'-, wherein each B and B' is independently —CO—, —COO— or —CONH— with the carbonyl group thereof being linked to A or D;

each R is a divalent linking group selected from the group consisting of

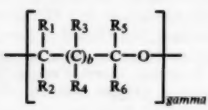
(i) an aliphatic divalent group of up to 25 carbon atoms which is uninterrupted or interrupted by an interrupting group selected from oxy, carbonyloxy, amino, aminocarbonyl, oxycarbonyl, ureido, oxycarbonylamino and carbonylimino;

(ii) a divalent-(aliphatic)$_{alpha}$-5-7-membered cycloaliphatic-(aliphatic)$_{beta}$-group wherein said non-cyclic aliphatic portions are each independently selected from the aliphatic groups set forth in (i) above, alpha and beta are each independently 0 or 1, and said group is uninterrupted or interrupted in the non-cyclic portion by an interrupting group set out in (i) above; and

(iii) a divalent-(aliphatic)$_{alpha}$-aryl-(aliphatic)$_{beta}$-group having 6 to 25 carbon atoms in the aryl portion, each non-aryl portion being independently selected from the aliphatic groups set forth in (i) above, and being uninterrupted or interrupted in the non-aryl portion or between the aryl portion and the non-aryl portion by an interrupting group set forth in (i) above; each of the groups in (iii) being unsubstituted or substituted by a substituent selected from the group consisting of halogen, C_{1-4}alkyl and C_{1-12}perhaloalkyl; and

each A is a copolymeric block of polyoxyalkylene, of which at least 30% of the A groups are selected from

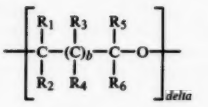
(a) homopolymer blocks of formula J



(J)

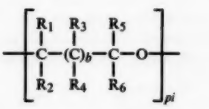
wherein b is 0 to 4, gamma is up to 15 and R_1 to R_6 are defined below; or

(b) copolymer blocks of formula B



(B)

wherein b is 0 to 4, R_1 to R_6 are defined below, and delta is up to 1000 provided that within delta, there is no homopolymeric block of more than 15 oxyalkylene units, the remaining groups being homopolymers or copolymers of formula C



(C)

wherein b is 0 to 4 and pi is up to 1000 repeating units without regard for the size of the homopolymeric subblocks within pi; and

wherein each of R_1, R_5 and R_6 are independently selected from the group consisting of hydrogen; an aliphatic, aromatic or heterocyclic radical selected from unsubstituted C_1–C_6-alkyl; substituted C_1–C_{16}-alkyl; unsubstituted C_2–C_{16}-alkenyl and substituted C_2–C_6-alkenyl; wherein the alkyl and alkenyl substituents are independently selected from the group selected from C_2–C_{16}-alkoxycarbonyl, C_3–C_{16}-alkenyloxycarbonyl, fluoro, aryl of up to 10 carbon atoms, C_1–C_8-alkoxy, C_2–C_6-alkanoyloxy, aryloxy of up to 10 carbon atoms, C_3–C_6-alkenyloxy, aroyloxy of up to 11 carbon atoms, C_3–C_8-cycloalkyl, C_3–C_8-cycloalkoxy, C_4–C_8-cycloalkylcarbonyloxy, C_4–C_8-cycloalkylcarbonyl, oxacycloalkyl of up to 7 carbon atoms, oxacycloalkoxy of up to 7 carbon atoms, oxacycloalkoxy (of up to 7 carbon atoms)-carbonyl, oxacycloalkyl (of up to 7 carbon atoms)-carbonyloxy and aryl (of up to 10 carbon atoms)-oxycarbonyl; each of said alkyl and alkenyl substituents being, in turn, optionally substituted by C_1–C_6-alkyl, fluoro or C_1–C_6-alkoxy provided said last mentioned alkoxy is not bound to a carbon atom already bound to another oxygen atom;

R_1, R_2, R_5 and R_6 are further independently aryl of up to 10 carbon atoms, C_3–C_8-cycloalkyl or oxacycloalkyl of up to 7 carbon atoms, each of said groups being unsubstituted or substituted with a substituent selected from the group of substituents for said alkyl as set forth above;

each of R_3 and R_4 is selected from the same group as set forth above for R_1; or R_3 and R_4 are further independently C_2–C_6-alkoxycarbonyl, C_2–C_{16}-alkanoyloxy, C_3–C_{16}-alkenoylcarbonyl or C_3–C_{16}-alkenoyloxy, each of which groups may be further substituted by fluoro, aryl of up to 10 carbon atoms or C_1–C_{16}-alkoxy; or R_3 and R_4 are further independently aryloxy of up to 10 carbon atoms, cycloalkoxy of up to 8 carbon atoms; cycloalkyl (of up to 8 carbon atoms)-carbonyloxy, cycloalkoxy (of up to 8 carbon atoms)-carbonyl, aryloxy of up to 11 carbon atoms, oxacycloalkoxy of up to 7 carbon atoms, oxacycloalkenoxy of up to 7 carbon atoms, oxacycloalkoxy (of up to 7 carbon atoms)-carbonyl, oxacycloalkyl (of up to 7

carbon atoms)-carbonyloxy, oxacycloalkenoxy (of up to 7 carbon atoms)-carbonyl or aryloxy (of up to 10 carbon atoms)-carbonyl; each of said groups may be further substituted by fluoro, C_1–C_6-alkyl or C_1–C_6-alkoxy, provided that any substituent having a oxygen atom or carbonyl group thereof as its link to the rest of the molecule may not be a substituent on the same carbon atom which is bonded to another oxygen atom; in addition two adjacent groups selected from R_1 to R_6, together with the atoms to which they are attached, may form a 5–8 membered cycloalkyl, 5–8-membered oxacycloalkyl or bicycloalkyl ring; such the resulting polymer absorbs more than 10% by weight of water when equilibrated therewith.

5,070,167
NOVEL PEROXIDE MONOMER AND A POLYMER THEREFROM

Noriyuki Tsuboniwa, Higashiosaka; Satoshi Urano, and Ryuzo Mizuguchi, both of Yawata, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Division of Ser. No. 201,964, Jun. 3, 1988. This application Feb. 28, 1991, Ser. No. 661,622

Claims priority, application Japan, Jun. 4, 1987, 62-142092; Jun. 4, 1987, 62-142093

Int. Cl.[5] C08F 8/06

U.S. Cl. 526—301 **2 Claims**

1. A polymer, whose main chain composed of carbon-carbon bonds, is bonded with a pendant peroxide group represented by the formula;

$$-A-OO-B \qquad (II)$$

wherein A represents —NH—CO—, —CO—NH—CO—, or —CO—O—CH_2CH_2—NH—CO—, and B represents a moiety which has excluded the group (—OOH) from a hydroperoxide, the content of the pendant peroxide group being 0.1 to 99.9% by weight and the molecular weight of said polymer being 1,000 to 100,000.

5,070,168
ETHER AMINE FUNCTIONAL SILICONE POLYMERS

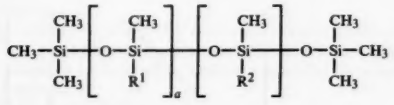
Anthony J. O'Lenick, Jr., Lilburn, Ga., assignor to Siltech Inc., Norcross, Ga.

Continuation-in-part of Ser. No. 448,308, Jan. 11, 1989, Pat. No. 4,973,643. This application Aug. 15, 1990, Ser. No. 567,613

Int. Cl.[5] C08G 77/00

U.S. Cl. 528—10 **4 Claims**

1. A process for treating fiber which comprises contacting the fiber with a conditioning amount of a silicone polymer which conforms to the following structure;



a is an integer from 1 to 200;
b is an integer from 1 to 200;
R^1 is selected from —(CH_2) nCH_3 phenyl;
n is an integer from 0 to 10;
R^2 is —$(CH_2)_3$—$(OCH_2CH_2)x$—$(OCH_2CH(CH_3))y$—$(OCH_2CH_2)z$—R^3;
x, y and z are integers and are independently selected from 0 to 20;
R^3 is selected from —$OCH_2CH_2NH_2$, —$OCH_2CH(CH_3)$—NH_2; or —$O(CH_2)_3$—N(H)—$[(CH_2)_{3-N(H)}]_m$—H;
m is an integer from 0 to 10.

5,070,169
WETTABLE, FLEXIBLE, OXYGEN PERMEABLE CONTACT LENS CONTAINING BLOCK COPOLYMER POLYSILOXANE-POLYOXYALKYLENE BACKBONE UNITS AND USE THEREOF

J. Richard Robertson; Kai C. Su, both of Alpharetta, Ga.; Merrill S. Goldenberg, Teaneck, N.J., and Karl F. Mueller, New York, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 315,224, Feb. 23, 1989, abandoned, which is a continuation of Ser. No. 160,624, Feb. 26, 1988, abandoned. This application Apr. 24, 1989, Ser. No. 342,848

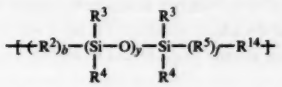
Int. Cl.[5] C08G 77/04

U.S. Cl. 528—25 **3 Claims**

1. A macromer comprising a segment, Seg, of the formula

$$-(R^{14}-Sil-[(L)_h-R^{14}Sil-]_n-(L)_h-R^{15}-A-[-L-R^{15}-A]_m)- \qquad (I)$$

wherein
R^{14} is a bond or —$N(R^1)$—, or if R^{14} is not attached to a silicon atom, then R^{14} may also be —O—;
R^{15} is —O— or —$N(R^1)$—;
R^1 is H, C_1–C_4-alkyl or phenyl;
n is 0–3;
m is 0–3;
h is 1, or h may be 0 when the atom Sil to which it would otherwise be attached is carbon;
each Sil is independently of the formula

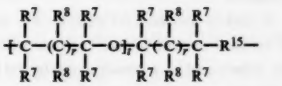


(IV)

each L is independently of the formula

$$-L^1-R^6-L^2-$$

each A is independently of the formula



(V)

each R^2 *and* R^5 are independently C_1–C_4-alkylene, carbonyl, C_1–C_6-alkylene-carbonyl, C_1–C_4-alkylene-(oxy-C_1–C_4-alkylene)$_g$ or C_1–C_4-alkylene-OCH_2-(hydroxy C_1–C_4alkylene)-CH_2—;
with g being an integer from 1 to 10;
each b and each f is independently 0 or 1;
each y is independently 1 to 200;
each R^3 and each R^4 are independently selected from C_1–C_{18}-alkyl or aryl of up to 12 carbon atoms;
each L^1 and each L^2 are independently —COO— or —CONH— in which the oxygen or nitrogen is bound to R^6, —CO— or a bond;
each R^6 is independently
(i) —(C_1–C_{25}-aliphatic)— or (ii) of the formula

$$-(C_{1-20}\text{aliphatic})_j-Q_k-[(5\text{–}7\text{ membered cycloaliphatic or aryl of up to 25 carbon atoms})-Q_{(k1)}-(C_{1-20}\text{aliphatic})_{(j1)}]_D$$

in which
each q is independently 0–3;
each j, each k, each (j_1) and each (k_1) are 0 or 1, but if j is 0, k is 0; and if (j_1) is 0, (k_1) is 0;
each D is 1 to 3;
each aliphatic group in R^6 (i) or (ii) above is uninterrupted at any point by Q;

each aliphatic, cycloaliphatic or aryl group within R^6 (i) or (ii) above is unsubstituted or substituted by one or more substituents which substituents are halogen, hydroxy, C_1–C_4alkyl. carboxy or C_1–C_{12}-perhaloalkyl;

each Q is independently selected from —O—, —COO—, —OCO—, —N(R^1)—, —N(R^1)CO—, —CON(R^1)—, —OOCN(R^1)—, —N(R^1)COO—, —OCOO— or —N(R^1)CON(R^1)—;

each r is independently 0–4;

each t is independently 3–200;

each R^7 is independently selected from groups (a) or (c) and each R^8 is independently selected from the groups (a), (b), (c) or (d);

(a) hydrogen, halogen, C_1–C_{16}-alkyl, C_2–C_{16}-alkenyl, or said alkyl or said alkenyl substituted by fluoro, by C_1–C_{16}-alkoxy, by C_2–C_{16}-alkanoyloxy, by C_1–C_{16}-alkoxy-CC-C_2–C_{16}-alkenyloxy-CO-, by C_3–C_{16}-alkenoyloxy, by aryl of up to 10 carbon atoms, by aroyl of up to 11 carbon atoms, by aroyloxy of up to 11 carbon atoms, by aryl of up to 10 carbon atoms-oxycarbonyl, by C_3–C_8-cycloalkyl, by C_3–C_8-cycloalkoxy, by C_3–C_8-cycloalkylcarbonyloxy, by C_3–C_8-cycloalkoxycarbonyl, by oxacycloalkyl of up to 7 carbon atoms, by oxacycloalkoxy of up to 7 carbon atoms, by oxacycloalkoxy of up to 7 carbon atoms-carbonyl or by oxacycloalkyl of up to 7 carbon atoms-carbonyloxy; with the proviso that the alkoxy substituent in (a) is not bound to a carbon atom already single bound to another oxygen atom;

(b) C_1–C_{16}-alkoxy, C_2–C_{16}-alkanoyloxy, C_1–C_{16}-alkoxy-CO-, C_2–C_{16}-alkenyloxy-CO- or C_3–C_{16}-alkenoyloxy, or any of said groups substituted by fluoro, by aryl of up to 10 carbon atoms or by C_1–C_6-alkoxy provided said alkoxy is not bound to a carbon atom which is singly bound to another oxygen atom;

(c) aryl of up to 10 carbon atoms, C_3–C_8-cycloalkyl or oxacycloalkyl of up to 7 carbon atoms, each of which is unsubstituted or substituted by a substituent selected from those indicated in (a) and (b) above; or

(d) aryloxy of up to 10 carbon atoms, cycloalkoxy of up to 8 carbon atoms, cycloalkyl of up to 8 carbon atoms-COO—, cycloalkoxy of up to 8 carbon atoms-carbonyl, aroyloxy of up to 11 carbon atoms, oxacycloalkoxy of up to 7 carbon atoms, oxacycloalkenyloxy of up to 7 carbon atoms, oxacycloalkoxy of up to 7 carbon atoms-carbonyl, oxacycloalkyl of up to 7 carbon atoms-carbonyloxy, aryloxy of up to 11 carbon atoms or aroyloxy of up to 11 carbon atoms, or any of said groups substituted by fluoro, by C_1–C_6-alkyl or by C_1–C_6-alkoxy provided said alkoxy substituent is not bound to a carbon atom which is singly bound to another oxygen atom; or

two adjacent R^7 and R^8 groups together with the atoms to which they are attached may form a 5–8 membered cycloalkyl, cycloalkenyl or oxacycloalkyl ring; or a 6–14 membered bicyclo-ring; and

with the proviso that at least 30% of the A groups contain no subblock in excess of 15 repeating units and where the A groups are copolymeric groups of the —E—X—E— type where the X subblock has approximately twice the number of repeating units as either subblock E has.

5,070,170

WETTABLE, RIGID GAS PERMEABLE, SUBSTANTIALLY NON-SWELLABLE CONTACT LENS CONTAINING BLOCK COPOLYMER POLYSILOXANE-POLYOXYALKYLENE BACKBONE UNITS, AND USE THEREOF

J. Richard Robertson, and Kai C. Su, both of Alpharetta, Ga., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 315,222, Feb. 23, 1989, abandoned, which is a continuation of Ser. No. 160,968, Feb. 26, 1988, abandoned. This application Apr. 24, 1989, Ser. No. 342,849

Int. Cl.[5] **C08G** *77/04*

U.S. Cl. 528—25 **3 Claims**

1. A macromer comprising a segment, Seg, of the formula

$$\text{-}R^{14}\text{—Sil—}[(L)_h\text{—}R^{14}\text{—Sil-}]_n(L)_h\text{—}R^{15}\text{—A-}[\text{-L—}R^{15}\text{—A-}]_m$$

wherein

R^{14} is a bond or —N(R^1)—, or —O—, provided that it may not be an oxygen if it is attached directly to a silicon atom or another oxygen atom, and may not be —N(R^1)— if R^{14} is attached directly to an oxygen atom or to a nitrogen atom;

R^{15} is —O— or —N(R^1)—;

R^1 is H, $C_{1\text{-}4}$alkyl, or phenyl;

n is 0–3;

m is 0–3;

h is 1, or h may be 0 when the atom of Sil to which it would otherwise be attached is carbon;

each Sil is independently of the formula

$$\text{—}R^{36}\text{—}(Sil^2)_{(x1)}[(Sil^3)(Sil^4)_{(x2)}(Sil^5)_{(x3)}R^{37}\text{—}R^{14}\text{—} \qquad \text{(IV)}$$

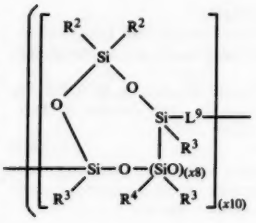
wherein (x1) and (x3) are independently an integer of from 0 to 25;

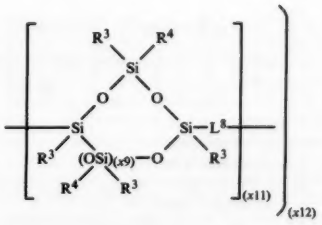
(x2) is an integer of from 1 to 25;

each (Sil^2), (Sil^3), (Sil^4), and (Sil^5) is independently selected from

cyclic siloxanes of the formula (IV^2)

(IV^2)





provided that Sil^2 is not the same as Sil^3, Sil^5 is not the same as Sil^4, and Sil^3 and Sil^4 are the same or different;

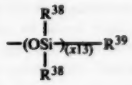
in which each R^3 may be the same or different;

each R^4 may be the same or different;

each of (x10) is independently zero to 25;

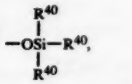
each of x11, and x12 is independently 1 to 25;

each or x8 and x9 is independently zero or one;
each R^3 and R^4 is independently selected from
a) C_{1-18}alkyl or aryl of up to 12 carbon atoms, each of which is unsubstituted or substituted by halogen or by C_{1-4}alkyl,
b) halogen; or
c) a group of the formula



(IX)

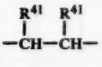
wherein (x13) is an integer of from 1 to 3; each R^{38} may be the same or different and is selected from C_{1-4}alkyl,



or C_{6-12}aryl, with each
R^{39} and each R^{40} being independently selected from C_{1-4}alkyl, C_{6-12}aryl, epoxy, halogen, hydroxy C_{1-4}alkyl, amino, amino-C_{1-4}alkyl, hydroxy, isocyanto, or isothiocyanato;
each L^8, and each L^9 is, when linking two Si atoms, independently a linking group of the formula

$$-L^{10}-(G-L^{10})_{(a3)} \qquad \text{(XII)}$$

wherein a3 is zero or one;
each L^{10} is independently selected from

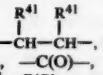


or —O— when (a3) is zero or one or further selected from —OC—(O)— and —OC(O)NR— when (a3) is one, and in which the atom of L^{10} bonded to a silicon atom is either a saturated carbon atom or an oxygen atom;
each R^{41} is independently hydrogen or lower alkyl; and when not linking 2 silicon atoms, and L^8 is independently further selected from a linking group of the formula

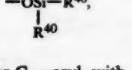
$$-L^{10}-(G-L^{11})_{(a4)} \qquad \text{(XIII)}$$

wherein (a4) is zero or one;
L^{10}, when (a4) is zero or one, is selected from

or oxygen;
and when (a4) is one, L^{10} is further selected from —OC-(O)— or OC(O)NR^1—, in which the atom of L^{10} which is bound to a silicon atom is either a saturated carbon or an oxygen;
L^{11} is selected from a bond,



—O—, —C(O)—, —OC(O)—, —C(O)0—, —OC(O)0—, —NR^1—C(O)—, —C(O)NR^1—, —OC(O)NR^1—, —NR^1-C(O)O—, or —NR^1C(O)NR^1—,
R^{41} and R^1 being as defined above;
G is a linking group selected from
a) a divalent aliphatic group having up to 25 carbon atoms, which may be interrupted by an interrupting unit selected from —O—, —COO—, —OOC—, —NRl—, —NR-^{1}CO—, OCNR^1—, —OOCNR^1—, —NR^1COO—, —OO-CO—, or —NR^1C(O)NR^1—; each of said divalent aliphatic groups whether interrupted or not being unsubstituted or substituted by lower alkyl;
b) a divalent 5–7 membered cycloaliphatic,,a divalent 5–7 membered cycloaliphatic-C_{1-18}aliphatic, and a divalent C_{1-18}aliphatic-5-7 membered cycloaliphatic-C_{1-18}-aliphatic, each of which may be interrupted in the non-cyclic portion or between the cyclic and non-cyclic portion as in a) above or be unsubstituted or substituted as in a) above, or both interrupted and substituted as in a) above;
c) a divalent C_{6-25}arylene which is unsubstituted or substituted by a subsituent selected from halogen, C_{1-4}alkyl, C_{1-12}perhaloalkyl, amino, carboxy, C_{1-4}alkoxy carbonyl, amino carbonyl, C_{1-4}alkylamino carbonyl di(C_{1-4}-alkyl) amino carbonyl, or a polyglycol of the formula

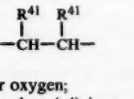


(XIV)

wherein (a5) is zero or one;
one of R^{42} and R^{43} is H and the other is hydrogen or methyl when (a5) is zero and both R^{42} and R^{43} are hydrogen when (a5) is one; and (a6) is an integer of up to 60; or
d) a divalent -(aliphatiyl)$_{(a7)}$- aryl(aliphatyl)$_{(a8)}$- wherein one of (a7) and (a8) is one and the other is independently zero or 1, each aliphatyl having up to 40 carbon atoms, the aryl portion being 6–14 carbon atoms, the aliphatyl portions being uninterrupted or interrupted as in a) above, the (aliphatyl)$_{(a7)}$ aryl-(aliphatyl)$_{(a8)}$ group further being uninterrupted or interrupted between either or both of the aliphatyl portions and the aryl portions by an interrupting group set out in a) above, the aliphatyl portions being independently unsubstituted or substituted by a substituent set forth in a) above, and the aryl portion being unsubstituted or substituted by a substituent set forth in c) above;
each R^{36} and each R^{37} is independently selected from a bond, or the same group from which L^8 is selected;
each L is independently of the formula
each A is independently of the formula

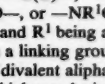
$$-L^1R^6L^2-$$

and
each A is independently of the formula



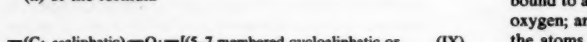
(V)

and within formula IV:
each R^2 and each R^5 are independently C_{1-7}alkylene, carbonyl, C_{1-6}alkylene carbonyl, C_{1-4}alkylene-(oxy-C_{1-4}-alkylene)$_g$ or C_{1-4}alkylene—OCH_2-(hydroxy C_{1-4}alkylene)-CH_2; and
with g being an integer of from 1 to 10;
each y is independently 1 to 200;
and each R^3 and each R^4 is independently selected from C_{1-18}alkyl or aryl of up to 12 carbon atoms; and within L:
each L^1 and each L^2 is independently



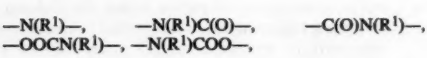
in which the oxygen or nitrogen is bound to R^6, or

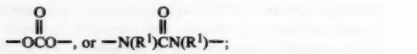
or a bond; and
each R^6 is independently
(i) —(C_{1-25}aliphatic)—
(ii) of the formula



(IX)

in which
each q is independently 0–3;
each j, each k, each (j_1) and each (k_1) and each d is independently 0 or 1 but if j is 0, k is 0 and if (j_1) is 0, (k_1) is 0;
each D is 1 to 3;
each aliphatic group in the R^6 (i) or (ii) above is uninterrupted or interrupted at any point by Q;
each aliphatic, cycloaliphatic, and aryl group within the R^6 (i) or (ii) above is unsubstituted or substituted by one or more substituents which substituents are halogen, hydroxy, C_{1-4}alkyl, carboxy or C_{1-12}perhaloalkyl;
each Q is independently selected from —O—,





and within formula V:
each r is independently 0–4;
each t is independently 3–200; and
each R^7 is independently selected from groups i) or iii) below and each R^8 is independently selected from groups i)–iv) below:
i) hydrogen, halogen, unsubstituted C_{1-16}alkyl, substituted C_{1-16}alkyl, unsubstituted C_{2-16}alkenyl, or substituted C_{2-16}alkenyl, wherein a) the substituents on the alkyl and alkenyl groups in i) are independently selected from fluoro, C_{1-16}alkoxy, C_{2-16}alkanoyloxy, C_{1-16}alkoxy-C(O)-C_{2-16}alkenyloxy-C(O)-, C_{3-16}alkenoyloxy, aryl of up to 10 carbon atoms, aryloxy of up to 10 carbon atoms, aroyl of up to 11 carbon atoms, aroyloxy of up to 11 carbon atoms, aryl (of up to 10 carbon atoms)-oxycarbonyl, C_{3-8}cycloalkyl, C_{3-8}cycloalkoxy, (C_{3-8}cycloalkyl)-carbonyloxy, (C_{3-8}cycloalkoxy)carbonyl, oxacycloalkyl of up to 7 carbon atoms, oxacycloalkoxy of up to 7 carbon atoms, oxacycloalkoxy (of up to 7 carbon atoms)-carbonyl, and oxacycloalkyl (of up to 7 carbon atoms)-carbonyloxy; and b) each alkyl or alkenyl group in a) being unsubstituted or further substituted by fluoro, C_{1-6}alkyl, or C_{1-6}alkoxy provide that said last mentioned alkoxy is not bound to a carbon already singly bound to another oxygen atom;
ii) C_{1-16}alkoxy, C_{2-16}alkanoyloxy, C_{1-16}alkoxy—C(O)—, C_{2-16}alkenyloxy—C(O)— and C_{3-16}alkenoyloxy, each of which may be further substituted by fluoro, aryl of up to 10 carbon atoms, or C_{1-6}alkoxy provided that the last mentioned alkoxy is not bound to a carbon atom which is singly bound to another oxygen;
iii) aryl of up to 10 carbon atoms, C_{3-8}cycloalkyl, and oxacycloalkyl of up to 7 carbon atoms, each of which is unsubstituted or substituted by a substituent selected from those indicated in i)a) or b) above; or
iv) aryloxy of up to 10 carbon atoms, cycloalkoxy of up to 8 carbons, cycloalkyl (of up to 8 carbons)—C(O)0—, cycloalkoxy (of up to 8 carbons)-carbonyl, aroyloxy of up to 11 carbons, oxacycloalkoxy of up to 7 carbons, oxacycloalkenyloxy of up to 7 carbons, oxacycloalkoxy (of up to 7 carbon atoms)-carbonyl, oxacycloalkyl (of up to 7 carbon atoms)-carbonyloxy, aryloxy of up to 11 carbon atoms, and aroyloxy of up to 11 carbon atoms, each of which is unsubstituted or substituted by fluoro, C_{1-6}alkyl, or C_{1-6}alkoxy, provided said last mentioned alkoxy is not bound to a carbon atom which is singly bound to another oxygen; and 2 adjacent groups R^7 and R^8, together with the atoms to which they are attached may define a 5–8 membered cycloalkyl, cycloalkenyl, or oxacycloalkyl ring or a 6–14 membered bicyclo-ring.

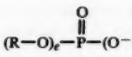
5,070,171

PHOSPHATED SILICONE POLYMERS

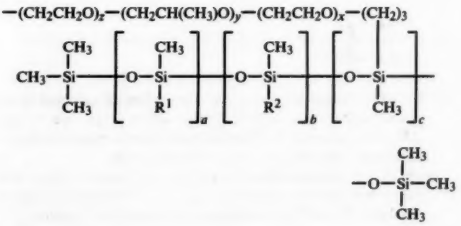
Anthony J. O'Lenick, Jr., Lilburn, Ga., assignor to Siltech Inc., Norcross, Ga.

Filed Jun. 27, 1990, Ser. No. 546,358
Int. Cl.[5] C08G 77/04
U.S. Cl. 528—33 **19 Claims**

1. A phosphated silicone polymer which conforms to the following structure;



wherein;
R is



a is an integer from 0 to 200;
b is an integer from 0 to 200;
c is an integer from 1 to 200;
R^1 is selected from —$(CH_2)_n CH_3$ and phenyl;
n is an integer from 0 to 10;
R^2 is —$(CH_2)_3$—$(OCH_2CH_2)x$—$(OCH_2CH(CH_3))y$—$(OCH_2CH_2)z$—OH;
x, y and z are integers and are independently selected from 0 to 20;
e and f range from 1 to 2 with the proviso that e+f=3;
M is selected from H, Na, K, Li or NH_4.

5,070,172

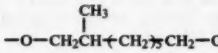
PROCESS FOR PRODUCING POLYURETHANE

Koji Hirai; Shunro Taniguchi, both of Kurashiki; Michihiro Ishiguro, Hasuki; Yoshifumi Murata, Nakajo; Shinichi Yokota, Kurashiki; Masao Ishii, Hasaki; Noriaki Yoshimura, Kurashiki, and Takayuki Okamura, Okayama, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

PCT No. PCT/JP87/00042, § 371 Date Sep. 22, 1988, § 102(e) Date Sep. 22, 1988, PCT Pub. No. WO88/05447, PCT Pub. Date Jul. 28, 1988
PCT Filed Jan. 22, 1987, Ser. No. 254,651
Int. Cl.[5] C08G 18/40, 18/42, 18/44, 18/48
U.S. Cl. 528—76 **14 Claims**

1. In a method for producing a polyurethane by the reaction consisting essentially of a polymeric polyol with a polyisocya-

nate, the improvement comprising, using as said polyol a polymeric polyol having in the molecule thereof a group represented by the formula I:



(I)

5,070,173

THERMOPLASTIC POLYURETHANE

Masahisa Yokota, Nobeoka; Atsushi Shimizu, Yokohama; Kyosuke Komiya, Kurashiki; Kazunori Yamataka, Yokohama, and Tadanori Nomura, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 227,818, Aug. 3, 1988, Pat. No. 4,855,377. This application Aug. 10, 1989, Ser. No. 392,154

Claims priority, application Japan, Aug. 4, 1987, 62-193769; Sep. 21, 1987, 62-236728

The portion of the term of this patent subsequent to Aug. 8, 2006, has been disclaimed.

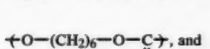
Int. Cl.[5] C08G *18/44*

U.S. Cl. 528—85 7 Claims

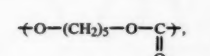
1. A diol chain-extended thermoplastic polyurethane comprising:

(a) a polyisocyanate component; and

(b) a polyol component which is a copolycarbonate comprising recurring units respectively of the formulae:



(A)



(B)

and terminal hydroxyl groups, the molar ratio of units (A) to units (B) being in the range of from 9:1 to 1:9, the copolycarbonate having a number average molecular weight of from 300 to 50,000.

5,070,174

POLYAMIDE EPOXY ESTER RESIN, PROCESS FOR PREPARATION THEREOF AND COATING COMPOSITION

Kaoru Ohba, Susono, Japan, assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 516,008, Apr. 27, 1990, abandoned. This application Dec. 31, 1990, Ser. No. 635,797

Claims priority, application Japan, Apr. 28, 1989, 1-107799

Int. Cl.[5] C08G *59/44;* C08L *63/02*

U.S. Cl. 528—104 10 Claims

1. A polyamide epoxy ester resin having a weight average molecular weight of 1,000 to 100,000, an epoxy equivalent of 500 to 10,000 and an acid value of not greater than 10, which is prepared by reacting

(i) at least one epoxy resin which is a glycidyl ether of a dihydric phenol,

(ii) at least one dihydric phenol: and

(iii) a polyamide dicarboxylic acid having an amine value of not greater than 20 and an acid value of at least 20, which is prepared by reacting a polymerized fatty acid derived from a dimer acid with a diamine at a polymerized fatty acid/diamine molar ratio of from 2/1.0 to 2/1.9,

at a ratio of such that the amount of the polyamide dicarboxylic acid segment in the resin ranges 1 to 30 percent by weight based on the weight of the resin.

5,070,175

METHOD FOR THE PREPARATION OF AN ORGANOPOLYSILOXANE CONTAINING TETRAFUNCTIONAL SILOXANE UNITS

Hiroshi Tsumura; Kiyoyuki Mutoh, both of Gunma; Kazushi Satoh, Tokyo, and Ken-ichi Isobe, Gunma, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed May 28, 1991, Ser. No. 706,148

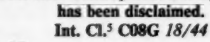
Claims priority, application Japan, May 29, 1990, 2-139119

Int. Cl.[5] C08G *77/06*

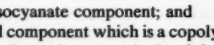
U.S. Cl. 528—12 7 Claims

1. A method for the preparation of an organopolysiloxane comprising tetrafunctional siloxane units which comprises the steps of:

(a) mixing an alkyl silicate or a partial hydrolysis product thereof as a first reactant with an organosilane compound represented by the general formula



in which R is a hydrogen atom or an unsubstituted or substituted monovalent hydrocarbon group, X is an alkoxy group or a hydroxyl group and the subscript a is 1, 2 or 3, or an oligomeric organosiloxane compound consisting of the siloxane units represented by the general unit formula



in which R has the same meaning as defined above and the subscript b is 1, 2 or 3, as a second reactant to form a mixture; and

(b) heating the mixture, in a pressurizable reaction vessel, in the presence of water and a sulfonic acid group-containing compound or phosphonitrile chloride as a catalyst at a temperature higher by at least 10° C. than the boiling point of the mixture under atmospheric pressure.

5,070,176

MELT PHASE POLYARYLATE PROCESS

Marc A. Strand, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 21, 1990, Ser. No. 586,181

Int. Cl.[5] C08G *63/62*

U.S. Cl. 528—194 2 Claims

1. A process for preparation of a polyarylate having a degree of polymerization of at least 50 comprising

(A) forming an admixture comprised of 4-dialkylaminopyridine, an acid anhydride prepared from an aliphatic carboxylic acid which contains from 2 to 6 carbon atoms, bisphenol-A and a mixture of isophthalic acid and terephthalic acid wherein the range of isophthalic acid is 20 to 100 mole percent and the range of terephthalic acid is 80 to 0 mole percent,

(B) polymerizing the admixture by

(1) subjecting the admixture to a pressure in the range of 500 to 1400 mm of Hg and a temperature in the range of 20° to 150° C. while maintaining a degree of polymerization of substantially 1.0,

(2) subjecting the admixture to a pressure in the range of 500 to 1400 mm of Hg and a temperature in the range of 285° to 350° C. to achieve an degree of polymerization in the range of 2 to 7,

(3) subjecting the admixture to a pressure in the range of 100 to 400 mm of Hg and a temperature in the range of 285° to 350° C. to achieve an degree of polymerization in the range of 7 to 15,

(4) subjecting the admixture to a pressure in the range of 100 to 400 mm of Hg and a temperature in the range of 330° to 400° C. to achieve an degree of polymerization in the range of 7 to 15, and

(5) subjecting the admixture to a pressure in the range of 10 to 75 mm of Hg and a temperature in the range of

330° to 400° C. to achieve an degree of polymerization of at least 50.

5,070,177

ULTRAVIOLET RADIATION RESISTANT POLYPHTHALATECARBONATE RESIN

Donald C. Clagett; Daniel W. Fox; Sheldon J. Shafer, and Paul D. Sybert, all of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 266,980, Nov. 4, 1988, abandoned. This application Jun. 26, 1989, Ser. No. 372,240

Int. Cl.[5] C08G *63/02*

U.S. Cl. 528—196 **3 Claims**

1. An aromatic polyphthalatecarbonate resin derived from:

(a) dihydric phenol;

(b) a carbonate precursor; and

(c) a phthalate compound providing phthalate units, said phthalate compound being present at a level of 5 mole percent based on the combined total moles of carbonate precursor, phthalate compound and dihydric phenol.

5,070,178

HIGHLY ELASTIC IONIC DYE-DYEABLE POLYETHER-ESTER BLOCK COPOLYMER FILAMENTS

Hironori Yamada, Matsuyama, Japan, assignor to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 425,734, Oct. 23, 1989, abandoned. This application Sep. 4, 1990, Ser. No. 577,808

Claims priority, application Japan, Oct. 26, 1988, 63-268295

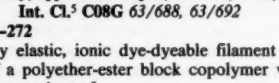
Int. Cl.[5] C08G *63/688, 63/692*

U.S. Cl. 528—272 **6 Claims**

1. A highly elastic, ionic dye-dyeable filament consisting essentially of a polyether-ester block copolymer which is a polymerization product of:

(A) a dicarboxylic acid component comprising 70 to 100 molar % of at least one member selected from the group consisting of terephthalic acid and ester-forming derivatives thereof and 0 to 30 molar % of at least one member selected from additional dicarboxylic acids other than terephthalic acid and ester-forming derivative thereof;

(B) 0.1 to 5 molar %, based on the molar amount of the dicarboxylic acid component (A), of a phosphonium sulfonate component comprising at least one quaternary phosphonium sulfonate compound of the formula (I):



(I)

wherein Z_1 represents a member selected from the group consisting of tri- or more valent aromatic and aliphatic groups, A_1 represents an ester-forming functional group having a member selected from the group consisting of carboxyl and hydroxyl radicals and ester-forming derivatives thereof, A_2 represents a member selected from the group consisting of a hydrogen atom and ester-forming functional groups having a member selected from the group consisting of carboxyl and hydroxyl radicals and ester-forming derivatives thereof, R^1, R^2, R^3 and R^4 represent respectively and independently from each other, a member selected from the group consisting of alkyl radicals and aryl radicals, and n represents a positive integer;

(C) 50 to 80% by weight, based on the total weight of the copolymer, of a polymeric glycol component comprising at least one polytetramethylene glycol having an average molecular weight of 400 to 6000; and

(D) a monomeric glycol component comprising 70 to 100 molar % of at least one member selected from the group consisting of 1,4-butane diol and ester-forming derivatives thereof and 0 to 30 molar % of at least one member selected from the group consisting of additional aliphatic glycols other than 1,4-butane diol and ester-forming derivatives thereof, said glycol component (D) being in an amount necessary to cause the total molar equivalent of the hydroxyl radicals and ester-forming derivatives thereof in the components (B), (C) and (D) to be substantially equal to the total molar equivalent of the carboxyl radicals and ester-forming derivative thereof in the components (A) and (B), and

having a limiting viscosity number of 1.2 or more, a melting point of 160° C. or more and a ½ crystallization time of 10 seconds or less at a temperature of 50° C.

5,070,179

WATER-SOLUBLE COPOLYMERIZED POLYESTER RESIN COMPOSITION

Kwang T. Kim; Tae H. Kim, and Young S. Kim, all of Seoul, Rep. of Korea, assignors to Cheil Synthetics Inc., Kyungbuk, Rep. of Korea

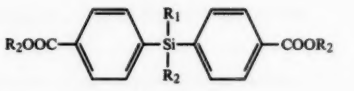
Filed Feb. 12, 1991, Ser. No. 653,963

Claims priority, application Rep. of Korea, Jun. 30, 1990, 9817

Int. Cl.[5] C08G *63/688, 63/695*

U.S. Cl. 528—272 **1 Claim**

1. A water-soluble copolymerized polyester resin composition comprising 50~85 mol % of aromatic dicarbonic acid, 0.5~25 mol % of aromatic dicarbonic acid containing sulfonic acid alkali metallic base and 0.5~25 mol % of dicarbonic acids containing silane system represented by the following formula (I) to the total dicarbonic acid components, wherein the glycol components contained in the composition comprising more than 60 mol % of aliphatic or alicyclic glycol and 1~40 mol % of diethylene glycol or triethylene glycol



(I)

wherein,

R_1 is aliphatic hydrocarbon group of 1 to 15 carbon atoms,

R_2 is aliphatic hydrocarbon group of 1 to 4 carbon atoms.

5,070,180

SHRINKABLE COPOLYESTER FILM

Yujiro Fukuda, Machida; Shigeo Utsumi, Yamato, and Shinobu Suzuki, Machida, all of Japan, assignors to Diafoil Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 446,141, Dec. 5, 1989, abandoned. This application Mar. 28, 1991, Ser. No. 679,140

Claims priority, application Japan, Dec. 7, 1988, 63-309439

Int. Cl.[5] C08G *63/20*

U.S. Cl. 528—272 **6 Claims**

1. A shrinkable copolyester film comprising a copolyester derived from 50 to 99 mol %, based on the total mole of acids, of terephthalic acid, 1 to 25 mol %, based on the total mole of acids, of an aliphatic dicarboxylic acid selected from the group consisting of oxalic acid, malonic acid, succinic acid, glutaric acid, adipic acid, pimelic acid, suberic acid, azelaic acid, sebacic acid and 1,10-decanedicarboxylic acid, 0 to 30 mol %, based on total mole of acids, of an aromatic dicarboxylic acid selected from the group consisting of phthalic acid, isophthalic acid, naphthalenedicarboxylic acid and diphenyl ether dicarboxylic acid, 70 to 100 mol %, based on the total mole of diols, of ethylene glycol and 0 to 30 mol % of a diol selected from the group consisting of neopentyl glycol, propylene glycol, 1,4-butanediol, trimethylene glycol, tetramethylene glycol, hexamethylene glycol, diethylene glycol, polyalkylene glycol and 1,4-cyclohexane dimethanol, the shrinkage of the film in the direction of either the machine direction or the transverse direction (main shrink direction) after 5 min treatment in an air oven at 100° C. being not less than 30%; the shrinkage of the film in the other direction perpendicular to said main shrink direction after 5 min treatment in an air oven at 100° C. being

not more than 20%; the initial shrinkage stress (F_0) of the film in the main shrink direction being not more than 2000 g/mm^2 during the course of 5 sec after dipped in a silicone oil at 75° C.; the shrinkage stress (F_{20}) of the film in the main shrink direction after 20 sec dipping in a silicone oil at 75° C. being not less than (F_0 − 100) g/mm^2; and the glass transition temperature of the film being 35° to 65° C.

5,070,181

POLYIMIDE FILM

Hideki Kawai; Kiyokazu Akahori, both of Kobe, and Hirosaku Nagano, Ootsu, all of Japan, assignors to Kanegafuchi Chemical Ind. Co., Ltd., Osaka, Japan

Continuation of Ser. No. 164,041, Mar. 4, 1988, abandoned. This application Aug. 7, 1989, Ser. No. 391,700

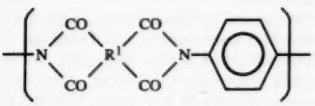
Claims priority, application Japan, Mar. 9, 1987, 62-53592

The portion of the term of this patent subsequent to Dec. 12, 2006, has been disclaimed.

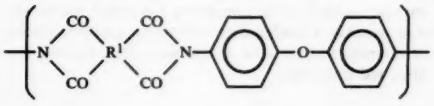
Int. Cl.[5] **C08G** *69/26, 8/02, 75/00*

U.S. Cl. 528—353 **2 Claims**

1. A film of a polyimide consisting essentially of repeating units of formula (2) and repeating units of formula (4)



(2)



(4)

wherein R^1 is

and the birefringence (Δn) of said film is at least 0.13.

5,070,182

POLYIMIDE RESIN AND INSULATING FILM FOR ELECTRIC AND ELECTRONIC DEVICES

Noriaki Kohtoh; Takashi Kobayashi, and Masahiko Yukawa, all of Ichihara, Japan, assignors to Nissan Chemical Industries Ltd., Tokyo, Japan

Division of Ser. No. 293,766, Jan. 5, 1989. This application Apr. 26, 1990, Ser. No. 514,945

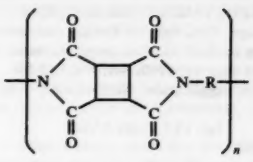
Claims priority, application Japan, Jan. 8, 1988, 63-1935; Jul. 11, 1988, 63-172157

The portion of the term of this patent subsequent to Oct. 22, 2008, has been disclaimed.

Int. Cl.[5] **C08G** *69/26, 8/02, 73/10*

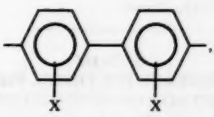
U.S. Cl. 528—353 **2 Claims**

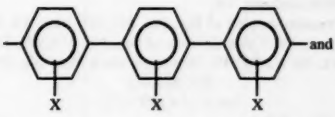
1. A polyimide insulating film for an electric or electronic device formed of repeating units of the formula:



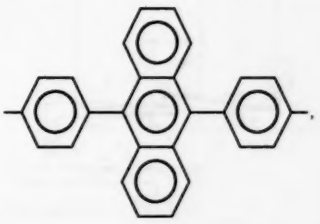
(I)

wherein R is a bivalent organic group selected from the group consisting of





and



wherein X is a hydrogen atom, an alkyl group, an acyl group, an alkoxy group or a halogen atom, or a bivalent organic group derived from a diamine selected from the group consisting of p-phenylenediamine, m-phenylenediamine, diaminodiphenylmethane, diaminodiphenyl ether, 2,2-diaminodiphenylpropane, diaminodiphenylsulfone, diaminobenzophenone, diaminonaphthalene, 1,3-bis(4-aminophenoxy)benzene, 1,4-bis(4-aminophenoxy)benzene,4,4′-di(4-aminophenoxy)diphenylsulfone,2,2′-bis[4-(4-aminophenoxy)phenyl]propane, and mixtures thereof.

5,070,183

HYPERBRANCHED POLYARYLENE

Young H. Kim, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 129,151, Dec. 7, 1987, Pat. No. 4,857,630. This application Apr. 20, 1989, Ser. No. 341,072

Int. Cl.[5] **C08G** *83/00*

U.S. Cl. 528—397 **4 Claims**

1. An optionally substituted soluble hyperbranched polyarylene having

(i) at least one branch per 10 repeating monomer units; and

(ii) a spherical diameter of less than 1000 Angstrom units.

5,070,184

TREATMENT OF CARBON MONOXIDE/OLEFIN COPOLYMER WITH SOLVENT

Pui K. Wong, Katy, Tex., and Eit Drent, Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 14, 1990, Ser. No. 522,701

Claims priority, application Netherlands, Jul. 26, 1989, 8901929

Int. Cl.[5] C08G *67/02*

U.S. Cl. 528—491 8 Claims

1. A process for increasing the average syndiotactic character of a stereoregular linear alternating copolymer of carbon monoxide and aliphatic α-olefin of at least 3 carbon atoms of relatively low stereoregular character by contacting the linear alternating polymer with a solvent selected from aromatic hydrocarbons or haloalkanes.

5,070,185

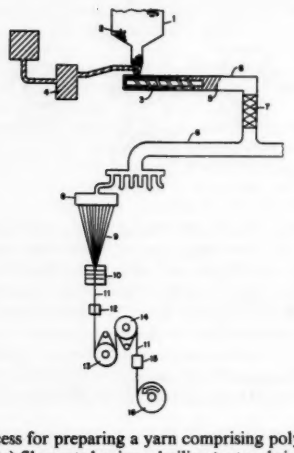
HIGH SHRINKAGE POLYESTER FIBERS AND METHOD OF PREPARATION

Wayne S. Stanko, Asheville, N.C., assignor to BASF Corporation, Williamsburg, Va.

Continuation-in-part of Ser. No. 323,735, Mar. 15, 1989, abandoned, which is a division of Ser. No. 136,308, Dec. 22, 1987, Pat. No. 4,826,949. This application Mar. 30, 1990, Ser. No. 503,084

Int. Cl.[5] C08F *6/00*

U.S. Cl. 528—502 8 Claims



1. A process for preparing a yarn comprising poly(ethylene terephthalate) filaments having a boiling water shrinkage after drawing of at least 40%, a long period spacing of greater than 225 Å and a crystallization from about 15% to 20%, comprising:

cold drawing a feeder yarn having a birefringence of at least 0.0175 at a draw ratio in the range of from about 1.98 to about 2.10.

5,070,186

MAGNESIUM CONTAINING INSULIN SOLUTION

Klaus Joergensen, Virum, Denmark, assignor to Novo Industri A/S, Bagsvaerd, Denmark

Continuation of Ser. No. 109,065, Oct. 16, 1987, abandoned. This application Apr. 19, 1989, Ser. No. 340,331

Claims priority, application Denmark, Oct. 20, 1986, 5033/86; Jul. 10, 1987, 3569/87

Int. Cl.[5] C07K *7/40;* A61K *37/26*

U.S. Cl. 530—304 12 Claims

1. Insulin preparations for parenteral administration containing at least 20 insulin units per ml, comprising a solution of an insulin and magnesium ions in a magnesium concentration in the range from about 0.02 to 0.5M, the preparation having a pH value in the range from about 3 to 8.5.

5,070,187

PHARMACOLOGICALLY EFFECTIVE ANTAGONISTS OF ARGININE-VASOPRESSIN

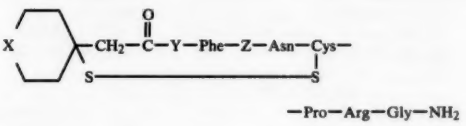
Haralambos Gavras, Marblehead, and Bernard Lammek, Newtonville, both of Mass., assignors to Trustees of Boston University, Boston, Mass.

Filed Nov. 3, 1989, Ser. No. 431,421

Int. Cl.[5] C07K *7/16, 7/06;* A61K *37/34*

U.S. Cl. 530—315 3 Claims

1. A potent vasopressin analogue antagonist comprising the formula:



wherein

X is selected from the group consisting of an oxygen atom and a sulfur atom;

Y is an amino acid residue selected from the group consisting of D-valine, D-α-amino butyric acid, D-leucine, D-isoleucine, D-tyrosine, and 0-alkyl-D-tyrosine wherein said alkyl moiety comprises 1–6 carbon atoms, and R-D-phenylalanine wherein R is a moiety selected from the group consisting of a hydrogen atom, a halogen substituent, and an alkyl group comprising 1–6 carbon atoms; and

Z is an amino acid residue selected from the group consisting of α-amino butyric acid, threonine, valine, alanine, leucine, and isoleucine.

5,070,188

ACYLATED EPIDERMAL GROWTH FACTOR

Francois K. Njieha, New Brunswick, and Shalaby W. Shalaby, Lebanon, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jul. 24, 1989, Ser. No. 383,518

Int. Cl.[5] C07K *7/10*

U.S. Cl. 530—324 4 Claims

1. A method for stabilizing epidermal growth factor (EGF) against proteolytic degradation, comprising:

acylating the EGF at one or more of the primary amines of amino acid residues asparagine 1, lysine 28 or lysine 48.

5,070,189

WATER-SOLUBLE AZO COMPOUNDS CONTAINING A SULFO-NAPHTHOL AS A COUPLING COMPONENT AND HAVING FIBER-REACTIVE GROUPS OF THE VINYLSULFONE SERIES, SUITABLE AS DYESTUFFS

Ludwig Schläfer, Kelkheim, and Werner H. Russ, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 24, 1989, Ser. No. 397,993

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1988, 3828849

Int. Cl.[5] C09B *62/53;* D06P *1/384, 3/10, 3/66*

U.S. Cl. 534—642 19 Claims

1. A water-soluble azo compound corresponding to the formula (1)

5,070,190

SUBSTITUTED N-GLYCOSYLAMIDES, PROCESS FOR THEIR PREPARATION, AND THEIR USE AS MEDICAMENTS

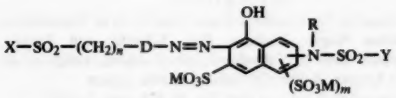
Oswald Lockhoff, Cologne; John Goossens, Leverkusen; Helmut Brunner, Wuppertal; Michael Sperzel, Wuppertal, and Klaus G. Stünkel, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 12, 1989, Ser. No. 336,497

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1988, 3812681

Int. Cl.[5] A61K *31/70*; C07H *5/04*

U.S. Cl. 536—22 9 Claims



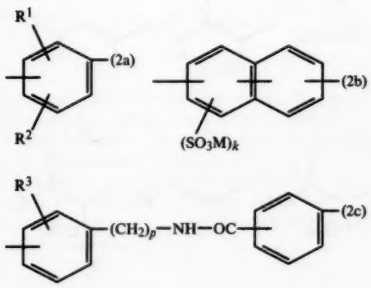
(I)

in which:

M is hydrogen or an alkali metal;

R is alkyl having 1 to 4 carbons;

D is a group corresponding to the formula (2a), (2b) or (2c)



in which

R^1 is hydrogen, alkyl having 1 to 4 carbons, hydroxy, nitro, alkoxy having 1 to 4 carbons, chlorine, bromine or carboxy,

R^2 is hydrogen, alkyl having 1 to 4 carbons, alkoxy having 1 to 4 carbons, chlorine or sulfo,

R^3 is hydrogen or sulfo,

k represents the number zero or 1 (and in the case where k is zero, this group denotes hydrogen),

p represents the number zero, 1 or 2 and

M has the abovementioned meaning;

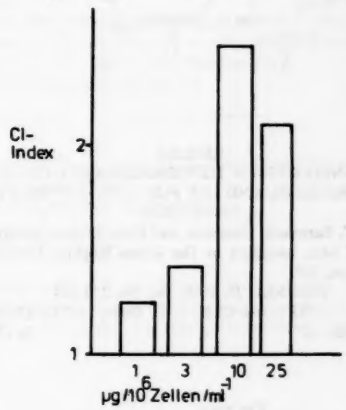
m is the number zero or 1 (and in the case where m is zero, this group denotes hydrogen);

n is the number zero or 1;

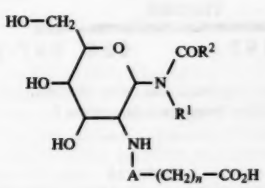
X is vinyl or β-thiosulfatoethyl or β-sulfatoethyl;

Y is vinyl or β-thiosulfatoethyl or β-sulfatoethyl;

and the individual formula members can have meanings which are identical to one another or different from one another.



1. A compound of the formula

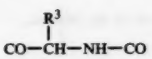


in which

R^1 denotes an alkyl radical or alkenyl radical having up to 50 carbon atoms,

R^2 denotes an alkyl radical or an alkenyl radical having up to 50 carbon atoms,

A represents —CO— or represents a group



in which

R^3 represents hydrogen, C_1–C_7 alkyl, hydroxymethyl, 1-hydroxyethyl, mercaptomethyl, 2-methyl-thioethyl, 3-aminopropyl, 3-ureidopropyl, 3-guanidylpropyl, 4-aminobutyl, carboxymethyl, carbamoyl-methyl, 2-carboxyethyl, 2-carbamoylethyl, benzyl, 4-hydroxybenzyl, 3-indolylmethyl or 4-imidazolyl-methyl, and

n represents 0 to 10 and pharmaceutically acceptable salts thereof.

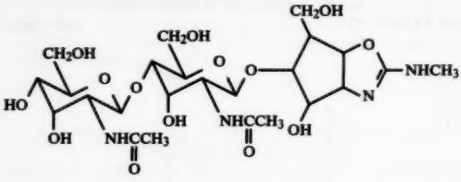
5,070,191

DEMETHYLALLOSAMIDIN AND A PROCESS FOR PRODUCTION THEREOF

Yasuhiro Yamada, Ikeda; Shohei Sakuda, Minoo, and Seiji Takayama, Kawasaki, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Apr. 27, 1990, Ser. No. 515,703
Claims priority, application Japan, Apr. 27, 1989, 1-105796
Int. Cl.[5] C07H *19/00, 21/00;* C07D *263/58*
U.S. Cl. 536—22 1 Claim

1. The compound represented by the following formula:

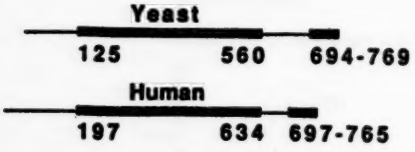


5,070,192

CLONED HUMAN TOPOISOMERASE I: CDNA EXPRESSION, AND USE FOR AUTOANTIBODY DETECTION

William C. Earnshaw, Monkton, and Peter D'Arpa, Baltimore, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Mar. 23, 1988, Ser. No. 172,159
Int. Cl.[5] C07H *21/04;* C12Q *1/68;* G01N *33/532, 33/564*
U.S. Cl. 536—27 16 Claims



1. A cDNA sequence consisting essentially of a cDNA sequence encoding human topoisomerase I.

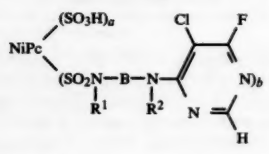
5,070,193

REACTIVE PHTHALOCYANINE DYESTUFFS

Karl H. Schündehütte; Manfred Groll, both of Leverkusen, and Josef W. Stawitz, Odenthal-Gloebusch, all of Fed. Rep. of Germany, assignors to Bayer Aakatiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 14, 1989, Ser. No. 450,632
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1988, 3843558
Int. Cl.[5] C09B *62/26;* D06P *1/382;* C07D *209/56*
U.S. Cl. 540—125 4 Claims

1. A reactive dyestuff of the formula



where

NiPc=radical of a nickel phthalocyanine,

R^1, R^2=H, unsubstituted C_1–C_4-alkyl or C_1–C_4-alkyl substituted by OH—, COOH—, OSO_3H, or SO_3H,

B=unsubstituted phenylene; phenylene substituted by C_1C_4-alkyl, C_1–C_4-alkoxy, halogen, nitro, cyano, COOH, SO_3H, carboxamide, sulphonamide, C_1–C_4-alkylcarbonylamino or $NHCONH_2$; C_2–C_8-alkylene or phenyl-C_1–C_4-alkylene,

a=2.5 to 3.1, and

b=1.2 to 0.9,

a+b being less than or equal to 4.

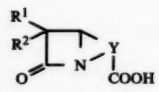
5,070,194

METHOD FOR PRODUCTION OF β-LACTAM DERIVATIVES

Michio Sasaoka; Nori Saito; Takashi Shiroi, all of Tokushima; Shigemitsu Nagao, Mobara; Ryo Kikuchi, and Yutaka Kameyama, both of Tokushima, all of Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

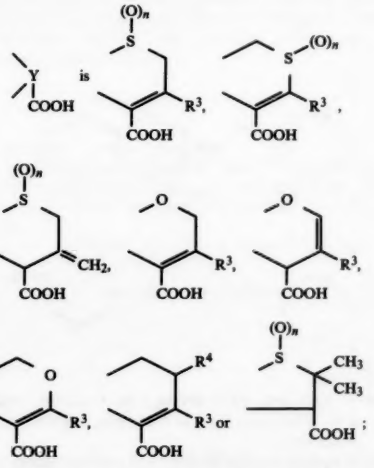
Continuation-in-part of Ser. No. 21,058, Jan. 6, 1987, abandoned. This application Apr. 5, 1989, Ser. No. 333,403
Int. Cl.[5] C07D *499/08*
U.S. Cl. 540—214 6 Claims

1. A method of producing a β-lactam derivative represented by the formula (I):



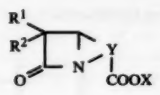
(I)

wherein R^1 is a hydrogen atom, a lower alkoxy group or a formamido group; R^2 is a hydrogen atom, a halogen atom, an amino group, an amido group or an imido group;



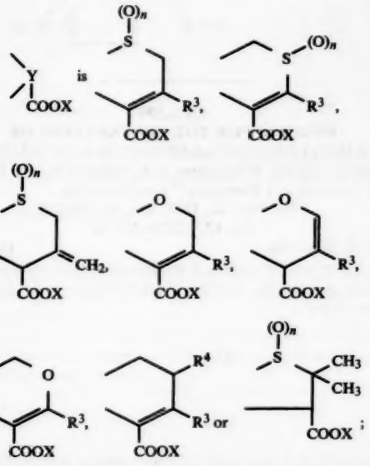
R^3 is a hydrogen atom, a hydroxyl group, a halogen atom, a lower alkoxyl group, a vinyl group unsubstituted or substituted by one or two halogen atoms bonded to the same carbon atom of said vinyl group, a lower alkoxymethyl group, acetoxymethyl group, carbamoyloxymethyl group, a heterocycle-thiomethyl group wherein the heterocycle is a five-membered heteroaromatic ring containing in the ring up to four heteroatoms selected from the group consisting of sulfur and nitrogen, said heteroaromatic ring being unsubstituted or substituted by a substitutent selected from the group consisting of methyl and ethyl, said substitutent being optionally substituted with a group selected from the group consisting of —SO_3H, —COOH, —OH, —NH_2, —$NHCH_3$, and —$N(CH_3)_2$, 5-

methyltetrazol-2-ylmethyl group, 1-methylpyrrolidinomethyl group or pyridiniummethyl group; R^4 is a hydrogen atom, a hydroxyl group, a halogen atom, a lower alkoxyl group, a group —OOCR wherein R is a lower alkyl group, a lower alkylthio group or a heterocycle-thio group wherein the heterocycle is as defined above; and n is 0, 1 or 2, said method consisting essentially of the step of reacting at a temperature in the range from room temperature to 100° C. a β-lactam derivative represented by the formula (II):



(II)

wherein R^1 and R^2 are as defined above,



and X is selected from the group consisting of a benzyl group having a hydroxyl group, a lower alkyl group or a lower alkoxy group as a phenyl ring substitutent, a diphenylmethyl group, a diphenylmethyl group having a hydroxyl group, a lower alkyl group or a lower alkoxy group as a phenyl ring substitutent, or tert-butyl, with a phenol in a reaction system which consists essentially of said β-lactam derivative of formula (II) and said phenol.

5,070,195

RING-OPENING PROCESS FOR PREPARATION OF 2-CHLOROSULFINYL AZETIDINONES

Jag M. Khanna; Naresh Kumar; Kiran Bala, and Yatendra Kumar, all of New Delhi, India, assignors to Ranbaxy Laboratories Limited, New Delhi, India

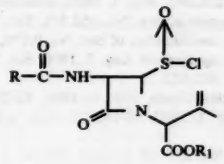
Filed Mar. 7, 1990, Ser. No. 490,151

Claims priority, application India, Nov. 6, 1989, CBR4500; Nov. 6, 1989, 10191DEL/89

Int. Cl.[5] C07D *205/95, 501/14;* C07B *45/04*

U.S. Cl. 540—218 **18 Claims**

1. A process of preparing a 2-chlorosulfinylazetidine-4-one of the formula



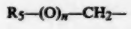
wherein R is hydrogen, C_1–C_3 alkyl, halomethyl or cyanomethyl;

or R is the group R_3 wherein R_3 is phenyl or phenyl substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, halo, protected hydroxy, nitro, cyano and trifluoromethyl;

or R is a group of the formula

wherein R_4 is a t-butyl, 2,2,2-trichloroethyl, benzyl or substituted benzyl;

or R is a group of the formula



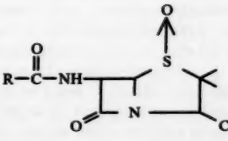
wherein R_5 is R_3 as defined above, 2-thienyl, 3-thienyl, 2-furyl, 3-furyl or 1,4-cyclohexadienyl, and n is 0 or 1;

or R is a substituted aryl alkyl group of the formula

wherein R_6 has the same meaning as R_5 defined above and W is protected hydroxy or protected amino; and

R_1 is a carboxylic acid protecting group selected from the group consisting of C_1–C_4 alkyl, 2,2,2-trihalo alkyl, benzyl, substituted benzyl, phenacyl, halo substituted phenacyl and benzhydryl,

which comprises heating in an inert organic solvent a penicillin sulfoxide ester of the formula



wherein R and R_1 are as defined above at a temperature between about 75° C. and about 140° C. with an N-chlorohalogenating agent in the presence of an organic solvent insoluble, strongly basic ion exchange resin, wherein said ion exchange resin incorporates a quaternary ammonium functionality.

5,070,196

ALKYLENEDIAMINE DERIVATIVES

Mitsuo Masaki, Chiba; Masaru Satoh, Koshigaya; Naoya Moritoh, Kuki; Koichi Hashimoto, Tokyo; Toshiro Kamishiro, Misato, and Haruhiko Shinozaki, Oomiya, all of Japan, assignors to Nippon Chemiphar Co., Ltd., Tokyo, Japan

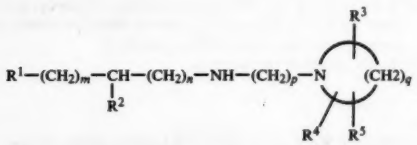
Continuation of Ser. No. 228,343, Aug. 1, 1988, abandoned, which is a continuation-in-part of Ser. No. 165,351, Feb. 29, 1988, abandoned, which is a continuation of Ser. No. 9,170, Jan. 30, 1987, abandoned. This application Aug. 1, 1990, Ser. No. 562,422

Claims priority, application Japan, Feb. 1, 1986, 61-20497; Feb. 1, 1986, 61-20498; Aug. 1, 1987, 62-193201; Aug. 1, 1987, 62-193203

Int. Cl.[5] C07D *225/04, 233/04, 211/14, 207/04*

U.S. Cl. 540—450 17 Claims

1. An alkylenediamine derivative having the formula:



wherein R^1 is a straight or branched chain alkyl group containing 3–8 carbon atoms, an alicyclic hydrocarbon group containing 5–8 carbon atoms, an aryl group, or an aralkyl group having an alkyl group containing 1–4 carbon atoms; R^2 is a straight or branched chain alkyl group containing 3–11 carbon atoms, an alkoxy group containing 3–11 carbon atoms, an aliphatic hydrocarbon group containing an ester bonding and 3–11 carbon atoms, an aliphatic hydrocarbon group containing an ether bonding and 3–11 carbon atoms, or an aryloxy group; each of R^3, R^4 and R^5 is hydrogen; and each of m and n is an integer of 0 to 3, provided that m+n does not exceed 3; p is an integer of 2 to 13; and q is an integer of 4 to 7.

5,070,197

DRY REACTIVE PROCESSING

James Chin, Cheshire; James B. Marshall, Southbury; Michael D. Drozdick, Terryville, all of Conn.; Fred C. Rosa, Wylie, Tex., and Frederick D. Judge, Cheshire, Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn.

Continuation of Ser. No. 208,827, Jun. 15, 1988, abandoned, which is a continuation of Ser. No. 841,904, Mar. 20, 1986, abandoned. This application Apr. 12, 1989, Ser. No. 336,921

Int. Cl.[5] C07D *273/16, 285/16, 209/48;* C07F *9/38*

U.S. Cl. 544—11 9 Claims

1. A continuous extruder process for preparing a water soluble, irregularly shaped, granular salt having an activity selected from the group consisting of herbicide, plant growth regulant, insecticide, fungicide, acaricide and bactericide, and having a residual moisture content no greater than 10%, which comprises:

feeding a solid, precursor acid selected from the group consisting of N-1-naphthylphthalamic acid, N-(phosphonomethyl)-glycine, 3-(1-methylethyl)-1H-2,1,3-benzothiadiazin-4 (3H)-one 2,2-dioxide, 2-(1-methylpropyl)-4,6-dinitrophenol, and 1,2-dihydropyridazine-3,6-dione of said salt and the respective solid alkali metal or alkaline earth metal hydroxide base into one end of an extruder reaction zone without the addition of extraneous solvent;

intimately admixing the compounds under shear conditions sufficiently high to result in stoichiometric conversion to said salt having a bulk density from about 38 to about 44 pounds per cubic foot, with at least 75% of the salt particles being in the size of 1–50 mesh;

and removing the water soluble, irregularly shaped, granular solid salt from the reaction zone.

5,070,198

AS-TRIAZINE COMPOUNDS

Piero Fossati, Lissone, Italy; Holger Heidenreich, Kuden, Fed. Rep. of Germany; Herbert Hugl, Gladbach, Fed. Rep. of Germany, and Klaus Wehling, Wuppertal, Fed. Rep. of Germany, assignors to Miles Inc., Elkhart, Ind.

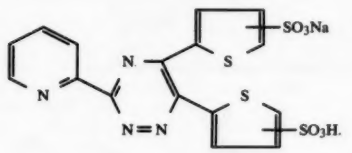
Division of Ser. No. 317,450, Mar. 1, 1989, Pat. No. 5,017,498. This application Dec. 10, 1990, Ser. No. 625,076

Claims priority, application Italy, Mar. 3, 1988, 47682 A/88

Int. Cl.[5] C07D *253/065*

U.S. Cl. 544—182 1 Claim

1. A compound having the formula



5,070,199

PROCESS FOR THE PREPARATION OF 2-AMINO-4-METHYL-6-METHOXY-1,3,5-TRIAZINE

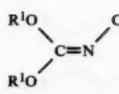
George C. Chiang, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 21, 1991, Ser. No. 703,528

Int. Cl.[5] C07D *251/42*

U.S. Cl. 544—194 14 Claims

1. A method for making 2-amino-4-methyl-6-methoxy-1,3,5-triazine comprising reacting dialkyl-N-cyanoimidocarbonate of the formula



wherein R^1 is C_1–C_3 alkyl with acetamidine hydrochloride or an O-alkylacetamidate hydrochloride under basic conditions.

5,070,200

PROCESS FOR THE PREPARATION OF CHLOROAMINES

Robert J. Raynor, North Branford, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Apr. 2, 1990, Ser. No. 503,021

Int. Cl.[5] C07D *239/00, 211/70, 233/54, 291/00*

U.S. Cl. 544—242 19 Claims

1. A process for chlorinating a primary amine which comprises reacting the amine with an aqueous hypochlorous acid solution containing at least 5% by weight of hypochlorous acid and being essentially free of chlorine, chlorate, and alkali metal ions, said process being conducted in an organic solvent.

5,070,201

PROCESS FOR THE PREPARATION OF AMINOPYRIMIDINES

Stephen Lachhein, Hofheim am Taunus, and Lothar Willms, Hillscheid, both of Fed. Rep. of Germany, assignors to Hoechst AG, Frankfurt am Main, Fed. Rep. of Germany

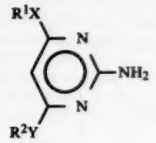
Filed Oct. 22, 1990, Ser. No. 601,224

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1989, 3935278

Int. Cl.[5] C07D *239/42*

U.S. Cl. 544—320 9 Claims

1. A process for the preparation of compounds of the formula I



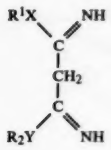
I

in which

X and Y are in each case oxygen or sulfur and

R^1, R^2 are independently of one another $(C_1–C_4)$alkyl, $(C_1–C_4)$alkoxy-$(C_1–C_2)$alkyl or halo$(C_1–C_4)$alkyl,

which comprises reacting a propanediimidate of the formula II



II

or its salt, where R^1, R^2, X and Y have the meaning defined for formula I, with a salt of the cyanamide of the formula III

$$(R^3)j(H^+)k\ [N{-}C{\equiv}N]^{2-} \qquad \text{III,}$$

in which

R^3 is an alkali metal or alkaline earth metal cation and

j=1 and k=0 if R^3 is an alkaline earth metal cation or

j=1 and k=1 or

j=2 and k=0 if R^3 is an alkali metal cation, in which a solution of the compounds of the formulae II and III in an alcohol of the formula IV

$$R^4{-}OH \qquad \text{IV,}$$

in which

R^4 is $(C_1–C_6)$alkyl,

or, simultaneously, separate solutions of the compounds of the formulae II and III in each case in an alcohol of said formula IV are added to an inert organic solvent which is higher-boiling compared to the alcohol at temperatures above 100° C. with simultaneous removal of the alcohol of the formula IV by distillation.

5,070,202

CYANOBUTYLATION OF AMINES WITH 2-PENTENITRILE

Frank E. Herkes, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 28, 1990, Ser. No. 500,572

Int. Cl.[5] C07D *295/00, 211/26;* C07C *255/00*

U.S. Cl. 544—402 **6 Claims**

1. A process for the cyanobutylation of amines with 2-pentenenitrile which comprises forming a reaction mixture of an amine selected from the class consisting of alkylamines having 1 to 10 carbon atoms, dimethylamine, dodecylamine, ethylenediamine, 2-methylpentamethylenediamine, 1,3-diaminopentane, 1,2-diaminocyclohexane, 3-methylpiperidine, octadecylamine hexamethylenediamine, and piperazine; 2-pentenenitrile and water, in which the molar ratio of 2-pentenenitrile to amine is 0.3 to 3, and the water concentration is between 15 and 60% by weight of the reaction mixture, and reacting the mixture at a temperature in the range of about 20 degrees to 200 degrees C. at a pressure in the range of about atmospheric to about 10 atmospheres.

5,070,203

N,N'-SUBSTITUTEDBIS(PYRIDINIUM) SALTS

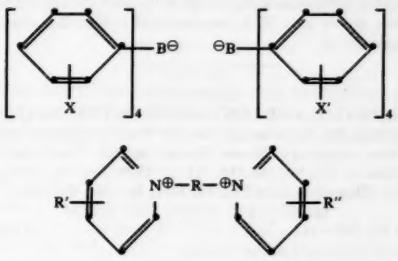
John C. Wilson, and Peter S. Alexandrovich, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 31, 1990, Ser. No. 560,939

Int. Cl.[5] C07F *5/02*

U.S. Cl. 546—13 **12 Claims**

1. An N,N'-substitutedbis(pyridinium) salt having the structure



wherein R is alkylene having from 1 to 20 carbon atoms or arylenedialkylene wherein each alkylene moiety has 1 to 6 carbon atoms and the arylene moiety has from 6 to 14 carbon atoms, R' and R'', which are the same or different, represent hydrogen, a straight or branched chain alkyl or alkoxy group having from 1 to 24 carbon atoms, aralkyl or alkaryl in which the alkyl group has 1 to 20 carbon atoms and the aryl group has from 6 to 14 carbon atoms, aryl having 6 to 14 carbon atoms which is unsubstituted or aryl having 6 to 14 carbon atoms which is substituted with one or more nitro, alkoxy or halo groups and X and X', which are the same or different, are chlorine, bromine, fluorine or iodine.

5,070,204

PROCESS FOR PREPARATION OF FLUOROMETHYL-SUBSTITUTED PYRIDINE DICARBOXYLATES

William Miller, Glendale, and Mitchell J. Pulwer, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 19, 1990, Ser. No. 495,185

Int. Cl.[5] C07D *211/90, 213/80, 213/803*

U.S. Cl. 546—321 **12 Claims**

1. A process for preparing a 4-(lower alkyl)-2-difluoromethyl-6-trifluoromethyl-3,5-pyridinedicarboxylic acid ester from a dihydropyridine starting material having the above substituents at the 3-, 4-, 5-, and 6- positions and having a trifluoromethyl substituent at the 2-position, which comprises contacting the starting material dissolved in an inert aprotic solvent with at least one half its molar amount of 1,4-diazabicyclo-[2.2.2]-octane (DABCO) in the presence of water in an amount sufficient to dissolve the resulting fluoride salt of said octane compound.

5,070,205

ALKYL 2-BENZYLIDENE-4-(BENZIMIDAZOL-1-YL) BENZOYLACETATE ESTERS AS INTERMEDIATES

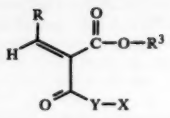
Melvin Cooper, Deal; Michael J. Fray, Canterbury; Kenneth Richardson, Birchington, and John Steele, Sandwich, all of England, assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 251,413, Sep. 29, 1958, Pat. No. 4,935,430. This application May 1, 1990, Ser. No. 517,286

Int. Cl.[5] C07D *235/04*

U.S. Cl. 548—333 **1 Claim**

1. A compound of the formula (IV):



wherein Y is 1,4-phenylene, R is phenyl, chlorophenyl, trifluoromethoxyphenyl, difluorophenyl, cyanophenyl, fluorophenyl or methylenedioxyphenyl, R^3 is alkyl having one to six carbon atoms ante X is benzimidazol-1-yl or 2-methylbenzimidazol-1-yl.

5,070,206

TETRAZOL-1-YL CONTAINING INTERMEDIATES

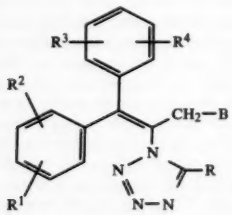
Sing-Yuen Sit, Meriden, and John J. Wright, Guilford, both of Conn., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 386,373, Jul. 28, 1989, Pat. No. 5,010,205. This application Feb. 13, 1991, Ser. No. 654,698

Int. Cl.[5] C07D *257/04;* **C07F** *9/6524*

U.S. Cl. 548—112 **6 Claims**

1. A compound of the formula



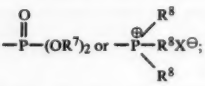
wherein

R^1, R^2, R^3 and R^4 each are independently hydrogen, halogen, C_{1-4}alkyl, C_{1-4}alkoxy, or trifluoromethyl;

R is hydrogen, C_{1-4}alkyl or phenyl;

B is hydroxy, X or Z;

Z is



X is bromo, chloro or iodo;

R^7 is C_{1-4}alkyl; and

R^8 is phenyl which is unsubstituted or substituted by one or two C_{1-4}alkyl or chloro substituents.

5,070,207

PHOSPHOLIPASE A2 INHIBITORS

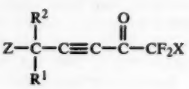
Guy A. Schiehser, Yardley, Pa., and Gregory F. Von Burg, Princeton, N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed Apr. 26, 1990, Ser. No. 516,023

Int. Cl.[5] C07D *275/04, 209/82, 49/213, 49/115*

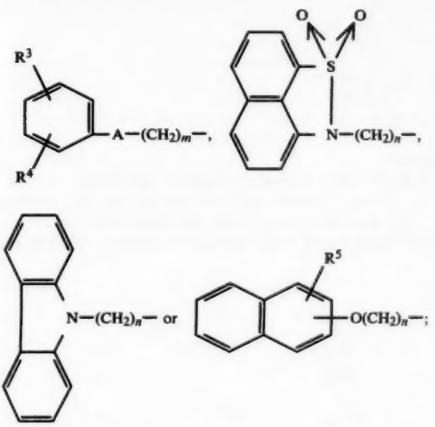
U.S. Cl. 548—208 **14 Claims**

1. A compound having the formula



wherein

Z is a group having the formula



R^1 and R^2 are each, independently, hydrogen or lower alkyl;

R^3 and R^4 are each, independently, hydrogen, alkyl of 1–20 carbon atoms, halo, halo lower alkyl, halo lower alkoxy, lower alkoxy, halo lower alkylsulfonyl, nitro or trifluoromethyl, where at least one of R^3 and R^4 is other than hydrogen;

R^5 is hydrogen, lower alkyl or halo;

A is $—CH_2—$, —O— or —S—;

m is 0–10;

n is 1–8;

X is hydrogen, fluoro, lower alkyl or aralkyl of 7–12 carbon atoms;

or a pharmacologically acceptable salt thereof.

5,070,208

METHOD FOR CRYSTALLIZATION OF OPTICALLY ACTIVE TRYPTOPHAN

Kenichi Yarita; Takahisa Tada, and Ryuichiro Kasatani, all of Kawasaki, Japan, assignors to Ajinomoto Company, Inc., Tokyo, Japan

Filed Mar. 15, 1991, Ser. No. 670,182

Claims priority, application Japan, Mar. 15, 1990, 2-65270

Int. Cl.[5] C07D *209/20*

U.S. Cl. 548—494 **8 Claims**

1. In a method for crystallizing optically active tryptophan through neutralization by mixing an acidic or alkaline aqueous solution of optically active tryptophan, which is obtained by the removal of impurities from an acidic or alkaline aqueous solution of optically active tryptophan containing impurities which inhibit flocculation and crystallization of optically active tryptophan, with an alkali or an acid, the improvement comprising: combining portions of an alkali or acid with portions of an acidic or alkaline aqueous solution of optically active tryptophan, from which the impurities have been removed, thereby neutralizing the aqueous solution containing optically active tryptophan such that the pH of the solution to be crystallized is kept in a range of 3 to 8, and simultaneously crystallizing optically active tryptophan as flocculated crystals.

5,070,209

12-HALOGENATED FORSKOLIN DERIVATIVES

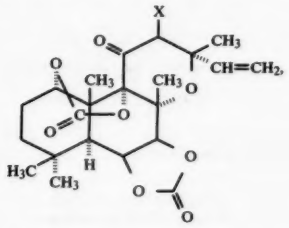
Gregory M. Shutske, Somerset, N.J., assignor to Hoechst Roussel Pharmaceuticals Inc., Somerville, N.J.

Division of Ser. No. 522,754, May 14, 1990, Pat. No. 5,023,344, which is a division of Ser. No. 390,126, Aug. 7, 1989, Pat. No. 4,978,678, which is a division of Ser. No. 932,553, Nov. 20, 1986, Pat. No. 4,871,764. This application Apr. 12, 1991, Ser. No. 673,449

Int. Cl.[5] C07D *319/08*

U.S. Cl. 549—228 1 Claim

1. A compound of the formula



wherein X is F, Cl, Br or I.

5,070,210

NOVEL KETENIMINES AS INTERMEDIATES FOR INSECTICIDES

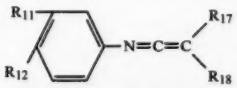
David B. Kanne, Richmond. Karl J. Fisher, Fairfax, both of Calif., assignors to ICI Americas Inc., Wilmington, Del.

Division of Ser. No. 263,605, Oct. 31, 1988, abandoned, which is a continuation-in-part of Ser. No. 122,877, Nov. 7, 1987, abandoned. This application May 7, 1990, Ser. No. 520,292

Int. Cl.[5] C07D *321/10, 321/12, 317/48;* C07C *251/16*

U.S. Cl. 549—350 2 Claims

1. A compound having the formula



in which R_{11} is halogen, C_1–C_4 haloalkyl, C_1–C_4 haloalkoxy, or C_1–C_4 haloalkylthio; R_{12} is halogen, C_1–C_4 haloalkyl, or C_1–C_4 haloalkoxy; or R_{11} and R_{12} taken together are C_1–C_4 alkylenedioxy or halo-C_1–C_3 alkylenedioxy; and R_{17} and R_{18} are independently hydrogen, C_1–C_4 alkyl, halogen, C_1–C_5 haloalkyl, C_1–C_3 alkoxy, C_2–C_5 alkenyl, or C_2–C_5 haloalkenyl, or R_{17} and R_{18} taken together are a C_2–C_3 alkylene chain optionally substituted by up to four methyl groups or up to two halogens.

5,070,211

DIOXO HETEROCYCLIC COMPOUNDS, COMPOSITION CONTAINING SAME AND PROCESS FOR PLANT GROWTH REGULATION USING SAME

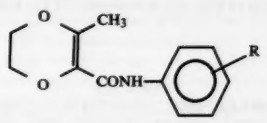
Mark A. Dekeyser, Waterloo, Canada, and Allen R. Blem, Cheshire, Conn., assignors to Uniroyal Chemical Company, Inc., Middlebury, Conn. and Uniroyal Chemical Ltd./Lte., Don Mills, Canada

Filed Oct. 1, 1990, Ser. No. 590,909

Int. Cl.[5] C07D *319/12;* A01N *43/32*

U.S. Cl. 549—378 6 Claims

1. A compound having the structural formula



where R is at least one of hydrogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen, cyano, phenyl, phenoxy, benzyl or $COOR^1$; and R^1 is C_1–C_4 alkyl.

5,070,212

INTERMEDIATES USEFUL FOR THE SYNTHESIS OF DELPHINIDIN CHLORIDE

Bruno Gabetta, and Raffaello Giorgi, both of Milan, Italy, assignors to IdB Holding SpA, Milan, Italy

Filed Mar. 26, 1990, Ser. No. 499,054

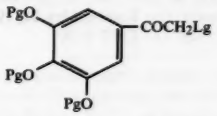
Claims priority, application United Kingdom, Mar. 28, 1989, 8907008

Int. Cl.[5] C07D *311/62*

U.S. Cl. 549—399 4 Claims

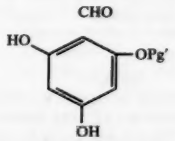
1. A process for producing delphinidin which comprises reacting a compound of formula

VII



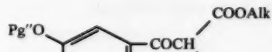
wherein each Pg represents a hydroxyl protecting group, and Lg represents an acyloxy group with a compound of formula

VIII



wherein Pg′ represents a hydroxyl protecting group characterised in that the compound of formula VII is produced from an intermediate of formula

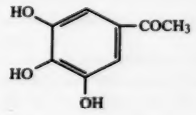
IX



wherein each Pg″ represents a hydroxyl protecting group and each Alk represents lower alkyl, by

(i) subjecting the intermediate of formula IX to hydrolysis and decarboxylation to form 3,4,5-trihydroxyacetophenone of formula

X



(ii) converting the 3,4,5-trihydroxyacetophenone to the compound of formula VII by introduction of the protect-

ing groups Pg and converting the group of formula $-COCH_3$ to a group of formula $-COCH_2Lg$.

5,070,213

PERFLUORO-4,4'-BIS(2,2-DIMETHYL-1,3-DIOXOLANE) AND ITS PREPARATION AND USE

Hsu-Nan Huang, Newark; Ming-Hong Hung, and Carl G. Krespan, both of Wilmington, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 17, 1990, Ser. No. 568,810

Int. Cl.[5] C07D *317/32*

U.S. Cl. 549—448 **1 Claim**

1. Perfluoro-4,4'-bis(2,2-dimethyl-1,3-dioxolane).

5,070,214

ORGANIC MATERIAL WITH EXTREMELY NARROW ELECTRON SPIN RESONANCE LINE AND GAUSSMETER PROBE OR MAGNETOMETER USING THIS MATERIAL

Paul Penven, Orsay; Philippe Michel, Paris; Denis Jerome, Jouy en Josas, and Alexandre Moradpour, Paris, all of France, assignors to Thomson CSF, Puteaux, France

Filed May 30, 1989, Ser. No. 358,141

Claims priority, application France, May 31, 1988, 88 07214

Int. Cl.[5] C07F *9/00*

U.S. Cl. 556—64 **8 Claims**

1. Gaussmeter or magnetometer probe comprising an organic material with a very narrow electronic spin resonance, said material being formed by a 1,2,7,8-tetrahydrocyclopentaperylene salt.

6. A 1,2,7,8-tetrahydrocyclopentaperylene salt wherein said salt is a hexafluoroarseniate and has a very narrow electronic spin resonance line.

5,070,215

VINYL CARBONATE AND VINYL CARBAMATE CONTACT LENS MATERIAL MONOMERS

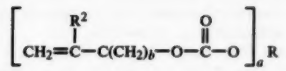
Ronald E. Bambury, Fairport, and David E. Seelye, Rochester, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed May 2, 1989, Ser. No. 346,204

Int. Cl.[5] C07F *7/08, 7/10*

U.S. Cl. 556—418 **8 Claims**

1. Compounds of the general formula



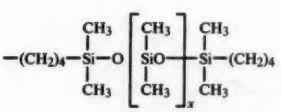
wherein

R^2 denotes —H or $-CH_3$;

b is 0 or 1;

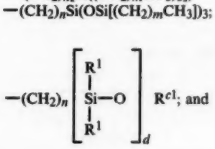
a is 1, 2, 3, or 4; and

R is an organosilicon radical chosen from the groups of radicals represented by the formulae:



wherein x is 25 on the average;

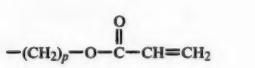
$(CH_2)_n[Si((CH_2)_mCH_3)_3]$;
$-(CH_2)_nSi(OSi[(CH_2)_mCH_3])_3$;



; and

where R^1 denotes a monovalent organic radical selected from the group consisting of an alkyl radical with 1 to 6 carbon atoms, or a fluoroalkyl radical with 1 to 6 carbon atoms;

R^{cl} denotes



p is 1 to 6; m is 0 to 5; and

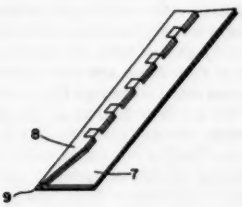
d is 1–200.

5,070,216

EMI SHIELDING GASKET

Steven L. Thornton, Windham, N.H., assignor to Chomerics, Inc., Woburn, Mass.

Filed Apr. 27, 1990, Ser. No. 515,898
Int. Cl.[5] H05K 9/00; B32B 15/04
U.S. Cl. 174—35 GC 6 Claims



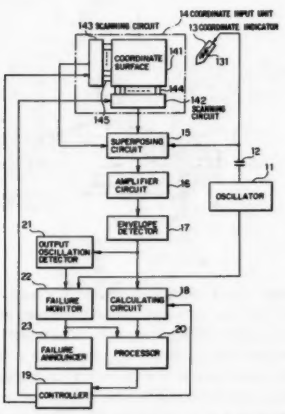
1. An EMI/RFI shielding gasket comprising an elongated strip of thermoplastic wherein the thermoplastic is a blend of ethylene vinyl acetate copolymer and polypropylene, the strip having two arms, each of the arms having an outer and inner surface, the outer surface of each of the arms having a layer of conductive metal bonded to it and wherein the metal is selected from the group consisting of gold, silver, platinum, palladium, copper, aluminum, zinc, tin, nickel, iron cobalt, mercury, chromium, tinned aluminum, tinned copper, silver plated copper and silver plated aluminum.

5,070,217

COORDINATE INPUT DEVICE CAPABLE OF INDICATING A FAILURE IN A COORDINATE INDICATOR

Tadashi Kobayashi, and Tetuo Kudo, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Nov. 14, 1990, Ser. No. 613,118
Claims priority, application Japan, Nov. 15, 1989, 1-298002
Int. Cl.[5] G08C 21/00
U.S. Cl. 178—19 4 Claims



1. A coordinate input device for use in indicating a location on a coordinate surface, said coordinate input device comprising:

oscillation generating means for generating an oscillation signal;

a capacitor connected to said oscillation generating means for producing said oscillation signal as an output oscillation signal;

coordinate indicator which has a winding connected to said capacitor for inducing a magnetic field;

a coordinate input unit which defines said coordinate surface, on which said coordinate indicator is movable, and which comprises a plurality of conductor loops, each conductor loop being for producing an electrical signal when magnetically coupled to said magnetic field;

superposing means connected to said conductor loops and said capacitor for superposing said electrical signal on said output oscillation signal to produce a superposed signal;

amplifying means connected to said superposing means for amplifying said superposed signal into an amplified signal;

envelope detector means connected to said amplifying means for detecting an envelope of said amplified signal to produce an envelope signal indicative of said location;

calculating means connected to said envelope detector means for using said envelope signal in calculating said location as a calculated location to produce a location signal representative of said calculated location;

output oscillation detector means connected to said envelope detector means for detecting said output oscillation signal to produce a detection signal; and

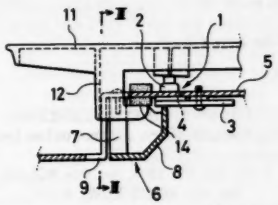
failure monitoring means connected to said output oscillation detector means for monitoring said detection signal to produce a fault signal when said detection signal is found faulty.

5,070,218

KEY GUIDE APPARATUS FOR ELECTRONIC MUSICAL INSTRUMENT

Masanori Katsuta, Iwata, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Hamamatsu, Japan

Filed Oct. 24, 1990, Ser. No. 602,591
Claims priority, application Japan, Oct. 26, 1989, 124524[U]
Int. Cl.[5] H01H 9/26; G10C 3/12
U.S. Cl. 200—5 A 4 Claims



1. A keyboard for an electronic musical instrument, said keyboard comprising:

a plurality of keyboard switches, wherein each switch comprises a switch base plate having one or more stationary contacts disposed thereon, said switch base plate being attached to a lower surface of a keyboard frame in a cantilevered manner; a flexible member located between said switch base plate and a manually depressed key which acts upon the flexible member when depressed; and a movable contact contained in said flexible member which contacts one of the stationary contacts when the key is depressed; and

said keyboard further comprising a key guide apparatus, wherein said key guide apparatus comprises a plurality of key guide pieces for guiding individual keys of said keyboard attached to said keyboard frame and a retaining member, said retaining member being disposed in contact with an end portion of said switch base plate.

5,070,219

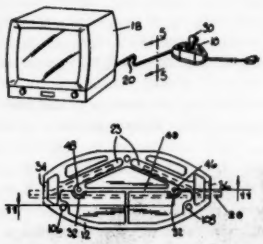
ELECTRICAL KEY LOCKED SWITCH

Duane D. Grosskrueger, 4281 E. Peakview Cir., and Dan Bliss, 6930 S. Yukon Way, both of Littleton, Colo. 80121

Filed Apr. 23, 1990, Ser. No. 513,065

Int. Cl.[5] H01H *43/00*

U.S. Cl. 200—43.008 **11 Claims**



1. An electrical key locked switch for a power cord of an electronic apparatus having at least two separate power leads comprising;

a protective outer casing formed of an electrically insulating material and including a base portion and a cover portion;

wire guide means formed on the base portion for retaining a first continuous lead of the power cord;

piercing guide means formed in the base portion for receiving two separate ends of a cut second lead of the power cord for retaining the separate ends of the cut second lead for piercing;

a first piercing spade attached to the cover portion and aligned with said piercing guide means and having a pointed projection for piercing a first end of the cut second lead of the power cord;

a second piercing spade attached to the cover portion and aligned with said piercing guide means and having a pointed projection for piercing a second end of the cut second wire of the power cord;

a key actuated electrical switch having contacts electrically connected to said first and said second piercing spades and which may be switched by a key lock to an "on" or an "off" position; and

attachment means for attaching the cover portion to the base portion to clamp the power cord and pierce the cut wire lead of the power cord.

5,070,220

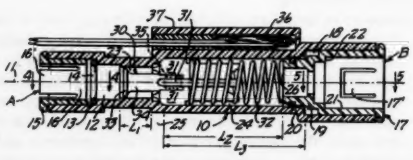
FLOW-SWITCH CONSTRUCTION

Brian J. Glenn, Meriden, Conn., assignor to Imo Industries, Inc., Princeton, N.J.

Filed Feb. 19, 1991, Ser. No. 657,656

Int. Cl.[5] H01H *35/40, 35/38*

U.S. Cl. 200—81.9 M **14 Claims**



1. A flow-switch construction, comprising an elongate tubular body having a central axis between an upstream inlet-port bore and a downstream outlet-port bore, a low-flow cylindrical bore of first diameter and first axial extent communicating with the inlet-port bore, a high-flow cylindrical bore of diameter greater than said first diameter and axial extent greater than said first axial extent, said high-flow bore communicating with the low-flow bore and with the outlet-port bore, a valve-member body having angularly spaced radial strut formations in piloting-guidance relation with said high-flow bore, a valve-member piston and stem integrally formed with said valve-member body, said stem projecting in the upstream direction beyond said strut formations and with relatively great clearance relation to the diameter of the low-flow bore, said stem positioning said piston at the upstream end of said valve-member body and with relatively close clearance relation to the diameter of the low-flow bore, a compressionally preloaded coil spring contained within said high-flow bore and reacting between said valve member body and a shoulder at the downstream end of said high-flow bore, whereby to normally position said piston at a maximum upstream location in the low-flow bore, the axial extent of the high-flow bore exceeding the axial extent of the low-flow bore by an amount sufficient to position said piston entirely within the high-flow bore when said valve-member body is at a maximum location of downstream displacement against said spring, a permanent magnet carried by said valve-member body and a magnetic-reed switch fixedly mounted to said tubular body in external overlap with a portion of the high-flow bore, the effective longitudinal position of said switch being such in relation to the field of said magnet that said switch changes its state upon valve-member-piston traverse of the axial location of change from the low-flow bore to the high-flow bore.

5,070,221

SWITCH DEVICE

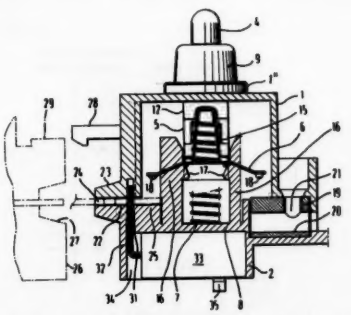
Edwin Weber, Gärtringen, Fed. Rep. of Germany, assignor to Kautt & Bux KG, Fed. Rep. of Germany

Filed Apr. 3, 1990, Ser. No. 504,404

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1989, 3910812

Int. Cl.[5] H01H *1/00*

U.S. Cl. 200—284 **14 Claims**



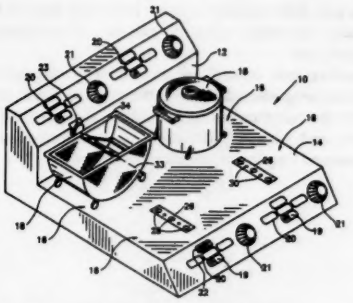
1. A device for a switch comprising a switch actuating member, at least one movable contact element which can be moved from a shut-off position into an actuated position by means of said switch actuating member, and a housing wall formed with a receptacle for receiving an opposing contact element which can be contacted by the movable contact element in its actuated position, wherein said receptacle does not include a contact element but is adapted to receive a contact element from the outside that is introduced through the housing wall; wherein said receptacle has an insertion opening which penetrates the wall of the housing; and wherein a portion of the receptacle is located inside the housing and said portion of the receptacle has a support surface for the contact element to be introduced therein, which support surface faces the movable contact element.

5,070,222

HEATING SYSTEM EMPLOYING AN INDUCTION PRODUCING ELEMENT AND A HIGH PERMEABILITY FOIL

Shimon Yahav, Rehovot, and Yair Daar, Moshav Galia, both of Israel, assignors to Lancet S.A., Piso, Panama

Filed Sep. 13, 1989, Ser. No. 406,568
Claims priority, application Israel, May 23, 1989, 90382
Int. Cl.[5] H05B *6/12*
U.S. Cl. 219—10.493 **43 Claims**



1. A domestic cooking system comprising:

a base defining at least one cooking location and comprising electromagnetic induction apparatus including an induction producing element operative to generate electromagnetic flux and at least one high permeability foil disposed so as to direct electromagnetic flux generated by the induction producing element to said at least one cooking location, and wherein said at least one high permeability foil is disposed beneath the induction producing element and has a thickness of less than 0.5 mm;

at least one cooking utensil defining a food heating surface and being operative to be heated by said electromagnetic flux at said cooking location; and

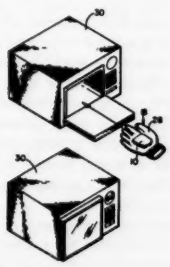
automatically operative stirring apparatus arranged to undergo pivotal reciprocal motion about a pivot axis location generally at the center of a circle defined by said food heating surface for reciprocal motion along said food heating surface.

5,070,223

MICROWAVE REHEATABLE CLOTHING AND TOYS

David A. Colasante, 38 Park St., Bldg. 18G, Florham Park, N.J. 07932-1744

Filed Mar. 1, 1989, Ser. No. 317,448
Int. Cl.[5] H05B *6/80*
U.S. Cl. 219—10.55 M **20 Claims**



8. A method comprising:

placing an article selected from the group consisting of clothing and toys, in a microwave heating apparatus, said article comprising an enclosed reservoir, said reservoir containing a microwave absorbing composition including at least one material selected from the group consisting of electrically conductive materials, magnetically permeable materials, materials having a Curie point, composites of electrically conductive materials with dielectric materials, and carbon, combined with at least one phase changing material selected from the group consisting of crystals and polymers; and

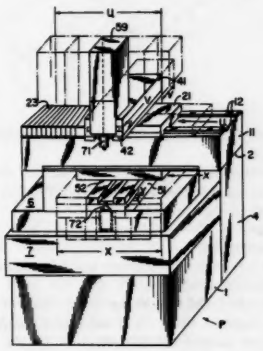
heating said article with microwave radiation generated by said microwave apparatus, whereby said composition heats to a predetermined temperature.

5,070,224

WIRE EROSION MACHINE

Klaus Töpfer, Worfelden, and Konrad J. Popp, Bobingen, both of Fed. Rep. of Germany, assignors to Nassovia Werkzeugmaschinen GmbH, Langen, Fed. Rep. of Germany

Filed Dec. 8, 1989, Ser. No. 448,017
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1988, 3841314
Int. Cl.[5] B23H *1/00, 7/10*
U.S. Cl. 219—69.12 **10 Claims**



1. Wire erosion machine in portal construction comprising:

a) a machine bed with two lateral columns,

b) a workpiece clamping table frame,

c.1) an upper cantilever arm above the workpiece clamping table frame comprising a wire deflecting guide,

c.2) a lower cantilever arm below the upper cantilever arm comprising a wire deflecting guide,

d) guide carriage and slide provided with controllable forward feed drives for the relative displacement of the cantilever arms in x, y and z axes relative to the workpiece clamping table frame

characterized by

e) a portal column (P) comprising one or more pieces and forming a first structural component unit,

f) a portal bridge (**11**) comprising one or more pieces which forms a second autonomous structural unit, is exchangeable, can be placed on the portal column (P) and is rigidly connectable with the portal column,

f.1) exchangeable upper and lower guide carriages (**21, 31**) above and below the portable bridge (**11**) in each instance which are displaceable in the x axis in guides (**12, 13**) and form a third and a fourth autonomous structural component group,

f.2) guide slides (**41, 51**) which are arranged at the guide carriages (**21, 31**) of the third and fourth structural component groups, constructed so as to be displaceable in the y axis as autonomous exchangeable units, and upper and lower cantilever arms (**43, 53**) which are connected with the exchangeable units and provided with wire guide and deflecting members.

5,070,225

METHOD FOR OVERHEAD SUBMERGED ARC WELDING AND APPARATUS TO IMPLEMENT THE SAME

Boris E. Paton; Vladimir V. Podgaetsky; Pavel A. Varenchuk; Nikolai T. Privalov; Vladimir I. Galinich; Valentin D. Kovalev, and Yaroslav A. Romanenko, all of Kiev, U.S.S.R., assignors to Institut Elektrosvarki Imeni E. O. Patona Akademii Nauk Ukrainskoi SSR, Kiev, U.S.S.R.

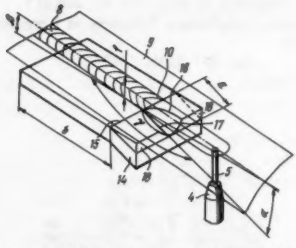
PCT No. PCT/SU88/00263, § 371 Date Feb. 6, 1990, § 102(e) Date Feb. 6, 1990, PCT Pub. No. WO89/11945, PCT Pub. Date Dec. 14, 1989

PCT Filed Dec. 14, 1988, Ser. No. 460,926

Claims priority, application U.S.S.R., Jun. 6, 1988, 4429057

Int. Cl.[5] B23K *9/18*

U.S. Cl. 219—73 **5 Claims**



1. A method of overhead submerged arc welding, comprising the steps of:

pressure-feeding flux to a joint being welded from below;

feeding a consumable electrode through the flux from below to the joint being welded;

striking an arc;

forming a weldpool;

welding the joint with subsequent solidification of the weldpool to form a weld;

molding the weld, the flux being fed at different pressure on different sections along the joint being welded, so that a first section before the arc relative to the weld being formed is fed under a constant prescribed pressure needed to provide conditions for pressuring the weldpool, a second section of arc burning and location of the weldpool is subjected to a pressure through a layer of flux and a layer of liquid slag, which is gradually built up so that maximum pressure of flux is applied to an area of beginning of weld solidifaction, wherein a bulk of the flux is pressure fed to a zone of formation of the weldpool and maximum flux pressure is distributed along a boundary of the area of weld solidification, the maximum flux pressure being maintained constant along the boundary of solidification.

5,070,226

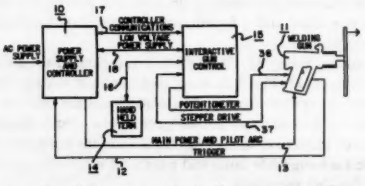
INTERACTIVE STUD WELDING GUN

Robert J. Raycher, Vincentown, and Ronald A. Cangro, Clementon, both of N.J., assignors to Erico Fastening Systems, Inc., Moorestown, N.J.

Filed Dec. 8, 1989, Ser. No. 447,894

Int. Cl.[5] B23K *9/20*

U.S. Cl. 219—98 **4 Claims**



1. In a stud welding system including a stud welding power supply and a stud welding gun having a gun body, a gun shaft assembly and included stud chuck thereupon for retaining a stud and which is movable within the stud welding gun body between lift and plunge positions, the improvements permitting controlled positive lift and plunge of the stud comprising:

signal means interconnected between the gun shaft assembly and the gun body to provide a position signal representative of the position of the gun shaft assembly relative to the gun body;

motor means interconnected between the gun body and the gun shaft assembly to positively and progressively drive the gun shaft assembly relative to the gun body in lift and plunge directions upon the presence of an energization signal; and

interactive gun control means including microprocessor means programmed to sense the position signal and provide the energization signal to drive the gun shaft to lift, hold and plunge positions of a preselected and programmed amplitude, duration and speed.

5,070,227

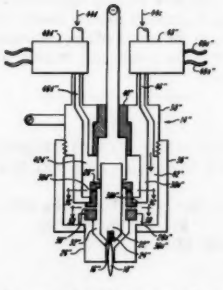
PROCESES AND APPARATUS FOR REDUCING ELECTRODE WEAR IN A PLASMA ARC TORCH

Lifeng Luo, Lebanon, N.H.; Nicholas A. Sanders, Norwich, Vt., and Richard W. Couch, Jr., Hanover, N.H., assignors to Hypertherm, Inc., Hanover, N.H.

Filed Apr. 24, 1990, Ser. No. 513,780

Int. Cl.[5] B23K *1/02*

U.S. Cl. 219—121.55 **21 Claims**



1. A process for reducing the wear of an electrode of a plasma arc torch having a torch body that mounts a nozzle at one end of the torch adjacent a workpiece in a spaced relationship with respect to the electrode to form a plasma chamber therebetween, means for directing a flow of an ionizable gas to the plasma chamber, and means for conducting an electrical current through the electrode to ionize the gas to form the plasma arc, said flow directing means producing a swirling flow in said plasma chamber for at least a portion of the operation of the plasma arc, comprising,

cutting off said electrical current at a time t_2 and

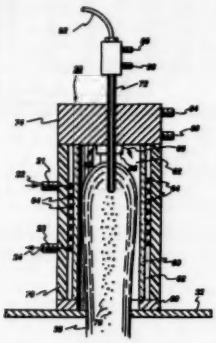
altering the flow of the ionizable gas through said chamber at a time t_1 immediately before t_2, said altering maintaining a gas flow through said chamber prior to said cutting off sufficient to control said arc, said altering also continuing after said current cutting off, and said altering producing a termination of a swirling flow through said chamber generally coincident with said cutting off.

5,070,228

METHOD FOR PLASMA SPRAY JOINING ACTIVE METAL SUBSTRATES

Paul A. Siemers, Clifton Park, and Stephen F. Rutkowski, Duanesburg, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 18, 1990, Ser. No. 539,248
Int. Cl.[5] B23K *9/00*
U.S. Cl. 219—121.46 **7 Claims**



1. A method for joining active metal substrates in a deposit zone traversing the areas to be joined on the substrates, comprising:

forming the substrates to have deposit receiving surfaces in the zone;

providing a powder of an active metal compatible to the substrates;

disposing the substrates in a radio frequency low-pressure plasma-spray apparatus to receive a spray deposit in the zone;

cleaning and preheating the deposit receiving surfaces by placing the substrates at a negative DC potential relative to a plasma from the apparatus, and passing the surfaces in heat coupling relation by the plasma; and

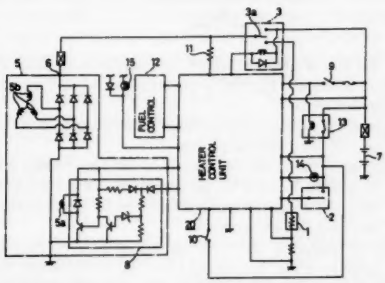
low-pressure plasma-spray depositing the powder onto the deposit receiving surfaces, to form a deposit in the zone that is diffusion bonded to the deposit receiving surfaces.

5,070,229

WINDOW HEATER CONTROLLING APPARATUS PROVIDING A GRADUAL HEATING VOLTAGE

Hiromichi Takatsuka, Tokyo, and Tetsuzo Kosaka, Isesaki, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 28, 1989, Ser. No. 329,850
Claims priority, application Japan, Mar. 28, 1988, 63-39666
Int. Cl.[5] H05B *1/02*; B60L *1/02*
U.S. Cl. 219—203 **2 Claims**



1. A window heater control apparatus for controlling a window heater for an automobile, said window heater control apparatus comprising:

generating means for generating a heating voltage for said window heater;

detecting means for detecting a heater-ON condition, said heater-ON condition being detected by sensing a turning on of a gear shift position switch when driving of said automobile is interrupted; and

a heater control unit which includes,

a timer counting a time lapse from detection of said heater-ON condition and outputting a time count value,

a processor processing said time count value to produce a switching control signal, and

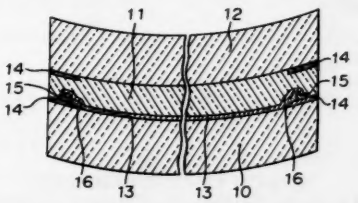
a switching element, connected to said generating means, switching a supply voltage to said generating means in response to said switching control signal to gradually increase said heating voltage up to a predetermined heating voltage in accordance with said time lapse.

5,070,230

ELECTRICALLY HEATABLE WINDSHIELD

Koichi Osada; Hisashi Nishiyama, and Akira Hirano, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Mar. 29, 1990, Ser. No. 501,867
Claims priority, application Japan, Mar. 31, 1989, 36270[U]; Oct. 9, 1989, 117961[U]
Int. Cl.[5] H05B *3/26*
U.S. Cl. 219—203 **9 Claims**



1. An electrically heatable windshield comprising:

two glass plates bonded to each other with an interlayer therebetween;

a transparent conductive layer formed at the contacting surface between one of said two glass plates and the interlayer so that the windshield is heated by supplying a current to the transparent conductive layer through a bus bar for feeding power;

a colored layer formed at the peripheral portion of the surface, in contact with the interlayer, of at least one of said two glass plates, said bus bar being formed on said colored layer without extending out from the edge of said colored layer; and

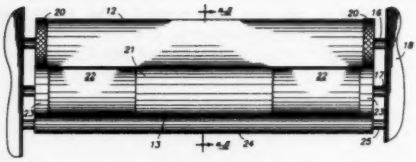
a transparent protective layer formed so as to cover the edge portion of the colored layer which is nearest the center of the glass plates, said transparent conductive layer being formed over said transparent protective layer.

5,070,231

ROLL-FUSING ASSEMBLY AND METHOD FOR THERMAL COMPENSATION IN AN ELECTROPHOTOGRAPHIC PRINTER

Michael W. Bacus; Dick T. Price, both of Spokane; Dale A. Lewis, Otis Orchards; Michael E. Demarchi, Spokane; Karl L. C. Homa, Chattaroy; Gary McInturff, Spokane, and Robert Gruell, Newman Lake, all of Wash., assignors to Output Technology Corporation, Spokane, Wash.

Filed Oct. 18, 1990, Ser. No. 600,751
Int. Cl.[5] H05B *1/00, 11/00*
U.S. Cl. 219—216 **26 Claims**



1. A method for moving continuous length print stock between paired pressure and fusing rollers rotatably mounted alongside one another in the fuser section of an electrophotographic printer, the rollers being designed to engage opposite surfaces of continuous length print stock selected from substantially different minimum and maximum print stock widths and thicknesses as it passes through a rolling nip between the rollers, comprising the following steps:

powering the fusing roller at a constant rotational speed;

driving the pressure roller from the fusing roller to synchronize their rotational speeds at the rolling nip;

centering continuous length print stock of a selected width across the rollers while directing it into the rolling nip at a constant linear speed; and

compensating for differences in thermal expansion conditions encountered across the rollers when handling differing print stock widths and thicknesses to thereby maintain uniformity of linear speed imparted to continuous length print stock by the rollers as it passes through the rolling nip.

5,070,232

OPTICAL COATING PYROLIZER

David A. Martin, Northridge, Calif., assignor to Lockheed Corporation, Calabasas, Calif.

Filed Dec. 21, 1989, Ser. No. 454,799
Int. Cl.[5] F27B *5/14;* **F27D** *11/00*
U.S. Cl. 219—390 **6 Claims**

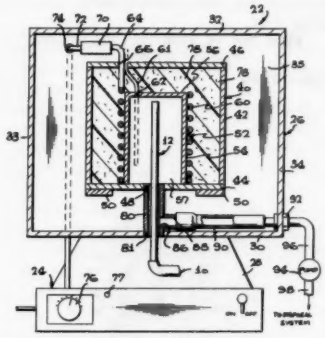
1. An apparatus for removing a coating from a fiber optic cable comprising:

a support member;

a heating coil having first and second ends and a specific total length mounted to said support member, said first end of said coil for receiving the fiber optic cable within the interior thereof;

a first hollow container mounted within said coil, said first container having first and second closed off ends in proximity to said first and second ends of said coil seal off the coil from the interior of said coil, respectively, said first end of said container having an aperture for receiving the fiber optic cable;

a power controller electrically coupled to said heating coil, said controller for controlling the temperature of said coil; and



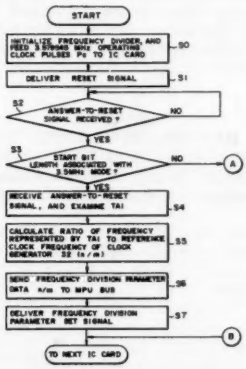
vacuum means coupled to said container for removing fumes from said interior of said container when a coating is pyrolized.

5,070,233

IC CARD READER/WRITER AND IC CARD TRANSACTIONS PROCESSING APPARATUS CAPABLE OF PRODUCING VARIOUS FREQUENCY CLOCK PULSES

Toshio Takizawa, and Hiroharu Hirata, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1989, Ser. No. 367,728
Claims priority, application Japan, Jun. 24, 1988, 63-154620
Int. Cl.[5] G06K *5/00*
U.S. Cl. 235—380 **4 Claims**



1. An IC card reader/writer for interchanging data with an IC card when said IC card is mounted to said IC card reader/-writer, comprising:

connector means for detachably connecting said IC card to said IC card reader/writer;

frequency mode identifying means for determining whether or not the IC card has an identifiable frequency mode on the basis of signals scanned from the IC card connected to the card reader/writer;

clock frequency determining means for, when said frequency mode identifying means determines that the frequency mode of the IC card is identifiable, reading frequency data stored in said IC card and representative of

an operating clock frequency for thereby determining the operating clock frequency;

reference clock generating means for generating reference clock pulses having a predetermined frequency to feed clock pulses to the IC card, said reference clock generating means comprising a first reference clock generator connected to the frequency identifying means and a second reference clock generator connected to the frequency setting means, and generating clock pulses which control the frequency mode identifying means; and

frequency setting means for converting, in response to an output of said clock frequency determining means, the reference clock pulses into clock pulses in response to which the IC card is operable, and for applying said clock pulses to said IC card.

5,070,234

CONNECTING DEVICE FOR IC CARD

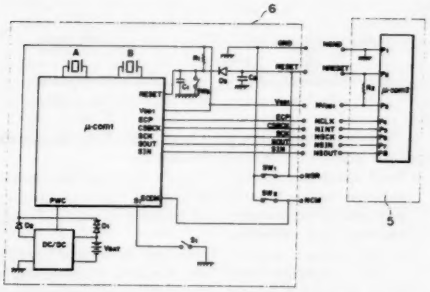
Noriyuki Ishii; Masayasu Hirano; Hideo Kajita; Hirokazu Kuroda; Shuji Izumi; Akihiko Fujino; Toshihiko Ishimura, and Reiji Seki, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 15, 1989, Ser. No. 352,187

Claims priority, application Japan, May 16, 1988, 63-118633

Int. Cl.[5] G06K *7/06*

U.S. Cl. 235—441 **5 Claims**



1. A connecting device for establishing electric connection between an electronic appliance and an IC card loaded in position in said electronic appliance, comprising a positive power source terminal, a negative power source terminal, a signal terminal and a reset terminal all located on said IC card, another positive power source terminal, another negative power source terminal, another signal terminal and another reset terminal all located on said electronic appliance for connection with said positive power source terminal, negative power source terminal, signal terminal and reset terminal on said IC card, respectively, and first switch means located on said electronic appliance for producing, in response to loading of said IC card in position into said electronic appliance, a signal for canceling a reset condition of said IC card, said terminals of said IC card and said electronic appliance being arranged such that, when said IC card is loaded in position into said electronic appliance, at first said negative power source terminal, reset terminal and positive power source terminal of said IC card are brought into contact with the corresponding terminals of said electronic appliance, and then said signal terminal of said IC card is brought into contact with said signal terminal of said electronic appliance, whereafter said first switch means of said electronic appliance are contacted by said IC card.

5,070,235

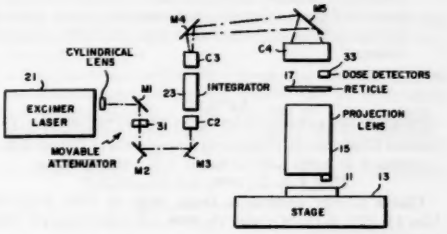
ACCUMULATED EXPOSURE DETECTION WITH EXPOSURE TERMINATING ATTENUATOR

Richard F. Hollman, Chelmsford, Mass., assignor to General Signal Corporation, Stamford, Conn.

Filed Jun. 18, 1990, Ser. No. 539,796

Int. Cl.[5] G01J *1/20*

U.S. Cl. 250—201.1 **8 Claims**



1. A method of controlling exposure in the illumination of photosensitive materials by a respectively pulsed light source to more accurately obtain a desired exposure level, said method comprising:

measuring the relative illuminating energy provided by successive pulses;

accumulating the successive measurements;

detecting when the accumulated value approaches the desired exposure level within a preselected difference;

inserting an attenuator in the light path between the source and the photosensitivie material, thereby to reduce the exposing energy provided by each pulse;

terminating the exposure when the accumulated value effectively reaches the desired exposure level.

5,070,236

IMAGE SENSOR WITH LOAD CAPACITORS FORMED FROM COMMON AND INDIVIDUAL ELECTRODES

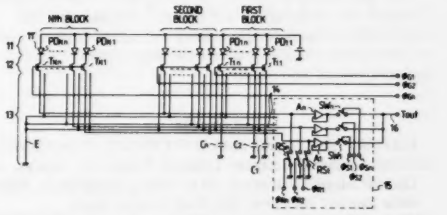
Hiroyuki Miyake, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 7, 1990, Ser. No. 578,889

Claims priority, application Japan, Oct. 4, 1989, 1-257947

Int. Cl.[5] H01J *40/14*

U.S. Cl. 250—208.1 **3 Claims**



1. An image sensor comprising:

a light-receiving element array having a plurality of light-receiving elements;

switching elements for transferring electric charges generated at said light-receiving elements every block consisting of a predetermined number of light-receiving elements;

multilayer interconnection for transferring said electric charges;

load capacitors, connected to said multilayer interconnection and arranged by a number corresponding to said predetermined number of light-receiving elements within said block, for storing said transferred electric charges,

said load capacitors comprising one electrode which is an individual electrode and the other electrode which is a common electrode, said electrodes interpose an insulating layer therebetween;

a drive IC for sequentially applying said electric charges stored by said load capacitors as voltage values; and

common signal lines guiding said electric charges from said load capacitors to said drive IC;

wherein said individual electrode of said load capacitor constitutes an upper electrode; said common electrode of said load capacitor constitutes a lower electrode; and said insulating layer is formed of a high dielectric constant material.

5,070,237

OPTICAL MEASUREMENT AND DETECTION SYSTEM

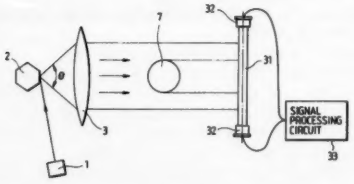
Takashi Okuyama, and Masatoshi Iwama, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo K.K., Tokyo, Japan

Filed Feb. 21, 1990, Ser. No. 482,627

Claims priority, application Japan, May 16, 1989, 1-121791; May 16, 1989, 1-121792; May 16, 1989, 1-121794; May 16, 1989, 1-121796

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.31 **19 Claims**



1. A device for examining an object to determine a characteristic thereof, said device comprising means for translating said object in a predetermined moving direction, irradiation means for irradiating said object with light, said irradiation means emitting light in a direction substantially perpendicular to said moving direction and detection means for detecting light received at a detection station, said detection means comprising:

a fluorescent optical fiber responsive to said light received at said detection station for generating fluorescent light which travels along said fiber to at least one end thereof;

photodetection means disposed at said one end of said fiber for generating an output indicating an amount of fluorescent light received at said one end of said fiber; and

detection circuitry for processing the output from said photodetection means to determine said predetermined characteristic of said object.

5,070,238

ROTARY ENCODER HAVING CIRCULAR MAGNET

Yukihiro Ishihara, Kaizuka; Tamotsu Yamamoto, Ashiya, and Hiroshi Matsui, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP89/01092, § 371 Date Jun. 21, 1990, § 102(e) Date Jun. 21, 1990, PCT Pub. No. WO90/04756, PCT Pub. Date May 3, 1990

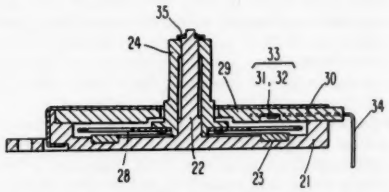
PCT Filed Oct. 25, 1989, Ser. No. 499,438

Claims priority, application Japan, Oct. 25, 1988, 63-268463

Int. Cl.[5] G01D *5/34*

U.S. Cl. 250—231.13 **6 Claims**

1. A light-reflecting rotary encoder comprising: a circular pulse plate which is made from a thin sheet of iron material and on which glossy reflective portions and non-reflective slits are disposed alternately and continuously at a fixed radius from the center of the circular plate; an optical element of reflective detector type which consists of a light-emitting element and a light-receiving element and is positioned so as to oppose the pulse plate on one side of the slits; a ring-shaped magnetic plate which faces the pulse plate on the opposite side to the optical element and at a fixed gap from the entire circumference of the



reflective portions and slits of the circular pulse plate, said ring-shaped magnetic plate being magnetized at positions facing the reflective portions on the pulse plate; and an operating shaft which rotates the pulse plate.

5,070,239

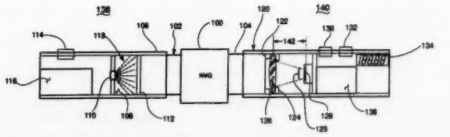
NIGHT VISION GOGGLE AMBIENT ILLUMINATION TESTING

Alan R. Pinkus, Oxford, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 5, 1990, Ser. No. 608,932

Int. Cl.[5] G01J *1/42*; G01D *18/00*

U.S. Cl. 250—252.1 **8 Claims**



1. Portable night vision goggle ambient light illumination apparatus comprising the combination of:

a fixed spectrum variable intensity light source assembly mounted within a portable container that is receivable in light sealed relationship with an input aperture of a night vision goggle under test;

said light source assembly including an infrared spectrum inclusive light emitting diode, means for controlling the level of energy output from said light emitted diode, means for diffusing the energy output of said light emitting diode, and first battery means for energizing said light emitting diode;

light output measuring apparatus mounted within a portable container receivable in light sealed relationship with the corresponding light output port of said night vision goggle under test;

said light output measuring apparatus including a visible spectrum optical energy to electrical energy transducer element, means for refracting the optical image output of said light outport port onto an optical energy reception surface of said transducer element, electrical signal measuring means for indicating the magnitude of said transducer electrical signal output, adjustment means for calibrating the maximum and minimum optical signal responses of said signal measuring means, and second battery means for energizing said electrical signal measuring means; and

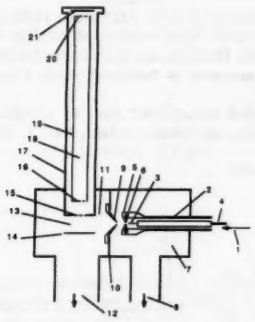
means for correlating a natural scene generated measurement by the combination of said night vision goggle with said light output measuring apparatus received thereon, after calibration of said maximum and minimum optical signal responses of said light output measuring apparatus, with predetermined objective minimal ambient illumination criteria for satisfactory goggle operation.

5,070,240

APPARATUS AND METHODS FOR TRACE COMPONENT ANALYSIS

Milton L. Lee, Pleasant Grove, and Chung H. Sin, Provo, both of Utah, assignors to Brigham Young University, Provo, Utah

Filed Aug. 29, 1990, Ser. No. 574,638
Int. Cl.[5] H01J *49/40*
U.S. Cl. 250—288 51 Claims



1. An apparatus for chemical species analysis using a time-of-flight mass spectrometer comprising:

ion production means for the production of ions or introduction of already produced ions in a region exterior to a vacuum region of the said time-of-flight mass spectrometer;

introduction means for permitting the produced ions to flow from the ion production region into said vacuum region of said time-of-flight mass spectrometer, such that the ion flow forms a supersonic jet; and

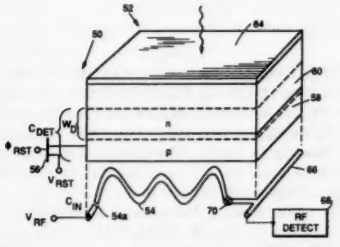
ion flow directing means for changing the ion flow direction from a supersonic jet flow axis into a flight tube of said time-of-flight mass spectrometer where the ions are separated and detected.

5,070,241

RESONANT FREQUENCY MODULATION DETECTOR

Michael D. Jack, Goleta, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.

Continuation-in-part of Ser. No. 387,209, Jul. 31, 1989, Pat. No. 4,962,316. This application Jul. 25, 1990, Ser. No. 557,884
Int. Cl.[5] H01L *39/00*
U.S. Cl. 250—336.2 26 Claims



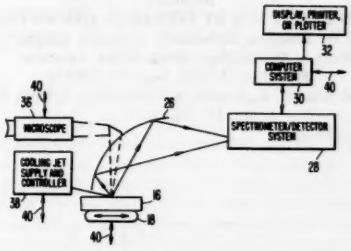
1. A radiation detector including a resonant cavity means comprised of transmission line means and having an input port for coupling to a frequency signal and an output port for coupling to sensor means for detecting a variation in the frequency signal, said resonant cavity means further comprising photovoltaic radiation detector means electrically coupled to said transmission line means, said resonant cavity means being responsive to electromagnetic radiation that is absorbed within said photovoltaic radiation detector means for having induced therein a detectable change in a resonant frequency of said resonant cavity means.

5,070,242

APPARATUS AND METHOD FOR TRANSIENT THERMAL INFRARED SPECTROMETRY

John F. McClelland, and Roger W. Jones, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Continuation-in-part of Ser. No. 576,448, Sep. 12, 1990, which is a continuation-in-part of Ser. No. 415,714, Oct. 21, 1989, which is a continuation-in-part of Ser. No. 297,297, Jan. 13, 1989, abandoned. This application Jul. 2, 1990, Ser. No. 546,738
Int. Cl.[5] G01N *21/71*
U.S. Cl. 250—339 21 Claims



1. A method for enabling analysis of a material comprising the steps of:

cooling a thin surface layer portion of the material to transiently generate a temperature differential between the thin surface layer portion and a lower portion of the material sufficient to alter the thermal infrared emission spectrum of the material from the black-body thermal infrared emission spectrum of the material; and

detecting the altered thermal infrared emission spectrum of the material while the altered thermal infrared emission spectrum is sufficiently free of self-absorption by the material of emitted infrared radiation, prior to the temperature differential propagating into the lower portion of the material to an extent such that the altered thermal infrared emission spectrum is no longer sufficiently free of self-absorption by the material of emitted infrared radiation, so that the detected altered thermal infrared emission spectrum is indicative of characteristics relating to molecular composition of the material.

5,070,243

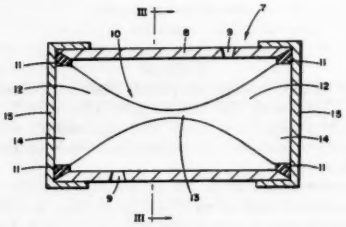
ATTENUATED TOTAL REFLECTION SPECTROSCOPY

Aharon Bornstein, Holon; Dan Wolfman, Tel-Aviv, and Mordechai Katz, Givatayim, all of Israel, assignors to The State of Israel, Atomic Energy Commission Roreq Nuclear Research Ctr., Yavne, Israel

Continuation-in-part of Ser. No. 518,788, May 4, 1990, abandoned. This application Feb. 12, 1991, Ser. No. 654,229
Claims priority, application Israel, Sep. 12, 1989, 91614
Int. Cl.[5] G01J *3/42*
U.S. Cl. 250—341 25 Claims

1. In a method of performing a spectroscopic measurement by the Attenuated Total Reflection technique, comprising providing a tubular probe for holding a substrate medium, and fitting within said probe at least one optical fiber sensor having

an unclad sensing zone and light intake and emitting ends, the improvement comprising said unclad sensing zone of each



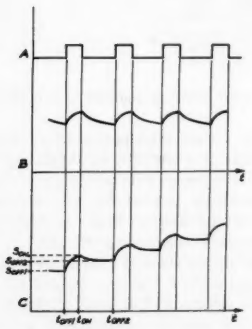
sensor including two frustoconical portions merging at their frustrums.

5,070,244

GAS DETECTION BY INFRARED ABSORPTION

Stephen W. Simpson, Blakehurst, Australia, assignor to The University of Sydney, New South Wales, Australia

Filed May 3, 1991, Ser. No. 695,573
Claims priority, application Australia, May 7, 1990, PK0010
Int. Cl.[5] G01N *21/61*
U.S. Cl. 250—343 **9 Claims**



1. A method of detecting for the presence of a gas within an atmosphere and which comprises beaming infrared radiation through a chamber containing the atmosphere, modulating the radiation by cyclically switching a source of the radiation on and off, detecting the level of radiation that impinges on an infrared detector within the chamber and generating an output signal representative of the detected level; characterized in that, during predetermined periods corresponding to on-off cycles of the radiation source, the output signal from the detector is sampled and:

(a) a first signal component which is representative of the amplitude of a first extremum of the output signal is stored,

(b) a second signal component which is representative of the amplitude of a second, succeeding, extremum of the output signal is stored,

(c) the first signal component is subtracted from the second signal component to produce a first difference signal,

(d) the second signal component is subtracted from a third signal component which is representative of the amplitude of a third, succeeding, extremum of the output signal to produce a second difference signal,

(e) the first difference signal is amplified by a factor which is proportional to the time period between the second and third extreme of the output signal,

(f) the second difference signal is amplified by a factor which is proportional to the time period between the first and second extreme of the output signal, and

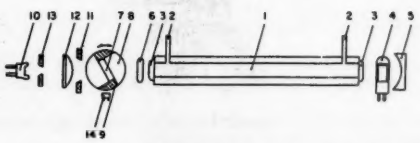
(g) the two amplified difference signals are subtracted to produce an output which is representative of the level of infrared radiation attributable to the radiation source.

5,070,245

APPARATUS AND METHOD FOR THE IDENTIFICATION OF GASES

Börje T. Rantala, Helsinki, and Kurt P. Weckström, Esbo, both of Finland, assignors to Instrumentarium Corporation, Finland

Filed Nov. 2, 1989, Ser. No. 430,823
Claims priority, application Finland, Nov. 4, 1988, 885115
Int. Cl.[5] G01N *21/35*
U.S. Cl. 250—343 **25 Claims**



1. Apparatus for the identification of one or more anesthetic or other gases included in the respiratory air of a patient, said apparatus comprising:

a source of radiation (4);

a chamber (1) for receiving the gas or gases to be examined and through which radiation from said source passes;

an optical interference filter means (7) for receiving and transmitting radiation passing through said chamber, said optical interference filter means having a transmission band within a range of 1.5%–0.4% of the mean transmission wavelength of incoming radiation, said optical interference filter means receiving the radiation at an angle of incidence within a range of 10°–60°;

optical focusing means (12) for the radiation transmitted by said optical interference filter means;

a radiation detector (10) for receiving radiation from said optical focusing means; and

measuring means (19) coupled to said radiation detector for analyzing the properties of the detected radiation obtained at more than two angles of incidence within said range of angles of incidence to identify the gas or gases.

5,070,246

SPECTROMETER FOR MEASURING THE CONCENTRATION OF COMPONENTS IN A FLUID STREAM AND METHOD FOR USING SAME

Michael D. Durham, Castle Rock; Donald H. Stedman, Englewood; Timothy G. Ebner, Westminster, and Mark R. Burkhardt, Englewood, all of Colo., assignors to ADA Technologies, Inc., Englewood, Colo.

Filed Sep. 22, 1989, Ser. No. 410,925
Int. Cl.[5] G01J *3/32*
U.S. Cl. 250—373 **42 Claims**

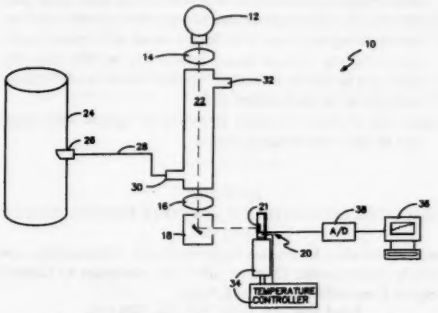
1. A method for in situ measurement of at least one component in a gas stream comprising:

a) passing radiation through an in situ gas stream,

b) selecting at least one wavelength range in which said component absorbs radiation,

c) measuring the amount of radiation which passes through said gas stream at a plurality of wavelengths within said selected wavelengths range, and

d) calculating the concentration of said component by comparing the difference in the amount of radiation which



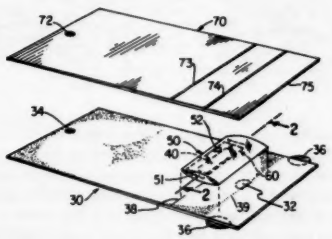
passes through said gas at two selected points within said selected wavelength range.

5,070,247

COLLAPSIBLE DETECTOR FOR SHORT AND LONG TERM MEASUREMENTS OF RADON GAS

Claude M. Wiblin, Summersville, W. Va., assignor to Radon Testing Corporation of America, Irvington, N.Y.

Filed Apr. 10, 1990, Ser. No. 507,239
Int. Cl.[5] G01T *1/00*
U.S. Cl. 250—472.1 **11 Claims**



1. A detector for detecting radon gas, comprising:

a collapsible housing having a bottom portion and a top portion, said top portion having folds, said housing defining between said bottom and top portions an interior volume with an open end when said top portion is in a folded condition;

an interior housing within said interior volume, said interior housing having means for enabling admission of radon gas from outside said open end; and

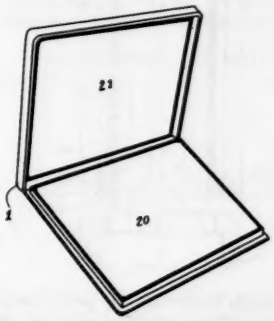
track registration means within said interior housing for forming damage tracks along paths traversed by alpha particles which are emitted as a result from decay of the radon gas, said top portion being collapsible from an open position when in said folded condition to a closed position when in an unfolded position, said interior housing defining a space between said interior housing and said track registration means when said top portion is in said open position, said interior housing collapsing said space as said top portion collapses into said unfolded condition so that said interior housing lays immediately on said track registration means, whereby a presence of air flow and air pockets within said interior housing is minimized when said top portion is in said unfolded condition and formation of further damage tracks which would otherwise arise from alpha particles emitted from radon gas in the air flow and air pockets if the space were left uncollapsed is thereby avoided.

5,070,248

CASSETTE WITH INTENSIFYING SCREENS TO BE USED WITH AN X-RAY FILM

Sergio Pesce, Savona, Italy, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 10, 1990, Ser. No. 550,677
Claims priority, application Italy, Jul. 12, 1989, 21165 A/89
Int. Cl.[5] G03C *1/46*
U.S. Cl. 250—483.1 **9 Claims**



1. A cassette comprising a front element hinged on the rear edge thereof to a back element of the cassette and a first fluorescent intensifying screen fixed, in the interior of said cassette, to said front element and a second fluorescent intensifying screen fixed, in the interior of said cassette, to said back element, said cassette containing a radiographic film comprising a transparent polymeric film having silver halide photosensitive layers on both sides, and said film is between and in close contact with said screens, said first intensifying screen comprising a first radiation emitting phosphor and said second intensifying screen comprising a second radiation emitting phosphor, characterized by the fact that said first radiation emitted by said first intensifying screen is in a first green region of the electromagnetic spectrum and said second radiation emitted by said second intensifying screen is in the ultraviolet region of the electromagnetic spectrum.

5,070,249

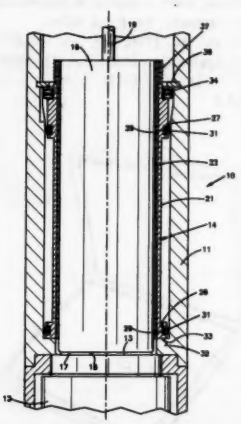
PHOTOMULTIPLIER TUBE MOUNTING FOR WELL LOGGING DETECTORS

John A. White, Chagrin Falls, Ohio, assignor to Bicron Corporation, Newbury, Ohio

Filed Dec. 12, 1989, Ser. No. 449,999
Int. Cl.[5] G01T *1/20*
U.S. Cl. 250—483.1 **13 Claims**

1. A photomultiplier tube and mounting system for use in environments normally subjecting the system to vibrations within a predetermined range of frequencies, comprising an elongated housing a support tube within said housing, high rate spring means extending between said support tube and housing to laterally suspend said support tube within said housing for limited relative movement, a photomultiplier tube closely fitting within said support tube, and a layer of elastomeric material extending between said photomultiplier tube and said support tube mounting said photo multiplier to be in said support tube for limited relative movement, said elastomeric mate-

rial and said spring means cooperating to establish a support system for said photomultiplier tube having a resonant frequency substantially higher than said predetermined range of frequencies for minimizing amplification of said vibrations.



5,070,250
POSITION DETECTION APPARATUS WITH ADJUSTABLE BEAM AND INTERFERENCE FRINGE POSITIONS

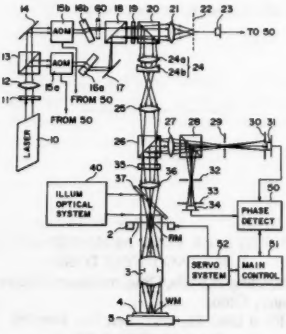
Koichiro Komatsu, Tokyo; Hideo Mizutani, Yokohama; Nobutaka Magome, Kawasaki, and Kazuya Ota, Tokyo, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Continuation of Ser. No. 482,557, Feb. 21, 1990, abandoned. This application Feb. 1, 1991, Ser. No. 649,340

Claims priority, application Japan, Feb. 28, 1989, 1-48295; Jun. 5, 1989, 1-142377

Int. Cl.[5] G01N *21/86*

U.S. Cl. 250—548 **2 Claims**



1. A position detection apparatus comprising:

a substrate having a diffraction grating;

means for supplying illuminating flux;

means for splitting said illuminating flux into two luminous fluxes;

means for modulating the frequency of at least one of said luminous fluxes by a predetermined value in order to obtain two luminous fluxes having frequencies that are different from each other;

means for causing the last-mentioned luminous fluxes to impinge upon said substrate in such a manner that they pass along independent optical paths and then are incident on said diffraction grating from different directions;

means for adjusting an intersection angle made by said two luminous fluxes incident on said diffraction grating;

means for adjusting the direction of arrangement of interference fringes generated on said diffraction grating by said two incident luminous fluxes, the last-mentioned adjusting means being disposed in at least one of said optical paths and including optical means which can be displaced for shifting a luminous flux received thereby in two directions orthogonal to each other; and

means for photo-electrically detecting an optical beat signal due to said interference fringes.

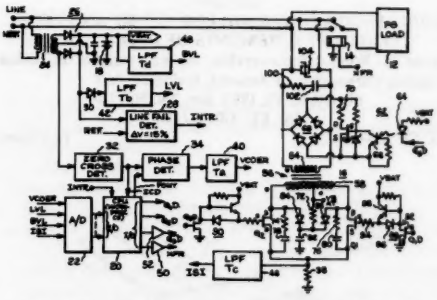
5,070,251
COMPUTER CONTROLLED STANDBY POWER SUPPLY SYSTEM

Bruce R. Rhodes, Inverness; Dave Bollinger, Schaumburg, and Mark Dombrowski, Chicago, all of Ill., assignors to General Signal Corporation, Stamford, Conn.

Filed May 25, 1990, Ser. No. 529,066

Int. Cl.[5] H02M *3/335*

U.S. Cl. 307—46 **39 Claims**



1. The method of generating, from a source of DC voltage, AC power of a voltage level corresponding to the voltage from an AC line and in synchronous relationship with the voltage from the AC line so as to provide a standby source of AC power to replace the power from said line when said line is in a failed state where it fails to provide power sufficient to operate a load, said method comprising the steps of inverting said DC voltage to generate an AC voltage comprising a train of input pulses, sensing current corresponding to the amplitude of each of said input pulses, varying the duty cycle of said pulses in response to said current to maintain said voltage level, and varying the time of occurrence of said pulses to provide said synchronous relationship.

5,070,252
AUTOMATIC TRANSFER SWITCH

Rene Castenschiold, New Vernon, and John P. Andersen, Hackettstown, both of N.J., assignors to Automatic Switch Company, Florham Park, N.J.

Filed Apr. 3, 1990, Ser. No. 503,781

Int. Cl.[5] H01H *9/20*

U.S. Cl. 307—64 **13 Claims**

1. An automatic transfer switch for transferring an electrical load from a normal source of electric power to an emergency source of electric power, and vice versa, comprising:

(a) a first set of phase switches for connection between the normal source and a load,

(b) a second set of phase switches for connection between the emergency source and the load,

(c) first and second neutral switches for connection between a normal source neutral conductor and the load neutral conductor,

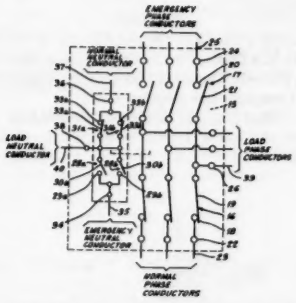
(d) third and fourth neutral switches for connection between

an emergency source neutral conductor and the load neutral conductor,

(e) actuator means for opening and closing said first set of phase switches,

(f) actuator means operable independently of said actuator means (e) for opening and closing said second set of phase switches,

(g) means responsive to operation of said actuator means (e) for opening said first neutral switch and closing said third



neutral switch when said first set of phase switches opens, and for closing said first neutral switch and opening said third neutral switch when said first set of phase switches closes, and

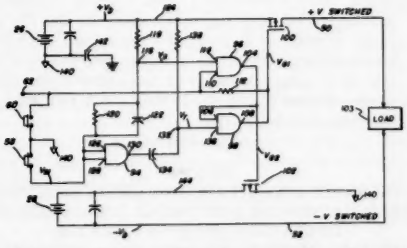
(h) means responsive to operation of said actuator means (f) for opening said second neutral switch and closing said fourth neutral switch when said second set of phase switches closes, and for closing said second neutral switch and opening said fourth neutral switch when said second set of phase switches opens.

5,070,253

SOLID STATE CONTROL CIRCUIT FOR A DUAL BATTERY POWER SUPPLY

Edward T. Wagner, Annapolis, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 27, 1990, Ser. No. 515,948
Int. Cl.[5] H02J *1/06*; H03K *17/56*
U.S. Cl. 307—75 **23 Claims**



1. Apparatus for controlling the connection of a pair of power supply voltages of mutually opposite clarity to a load, comprising:

a first and a second complementary type semiconductor switch device respectively coupled between said par of power supply voltages and said load;

a bistable circuit having two stable operating states, first and second inputs and first and second outputs;

first circuit means respectively coupling said first and second outputs to said fist and second semiconductor switch devices for rendering said switch devices conductive during one o aid two stable operating states; and

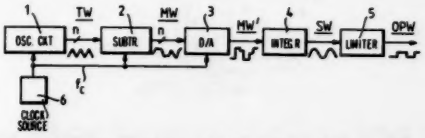
second circuit means including first switch means coupled to said first input and second switch means coupled to aid second input for selectively switching said bistable circuit between said two stable operating states.

5,070,254

PULSE GENERATORS WITH CONSTANT MARK/SPACE RATIO AND SMALL PHASE MODULATION JITTER

Christopher P. Summers, London, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 14, 1990, Ser. No. 494,202
Claims priority, application United Kingdom, Mar. 17, 1989, 8906227
Int. Cl.[5] H03K *21/02, 7/00*
U.S. Cl. 307—261 **8 Claims**



1. A pulse generator comprising, digital oscillator means for producing a succession of numbers which represent amplitude samples for a periodic analogue waveform, digital-to-analogue converter means for converting these numbers into a synthesised waveform, reconstruction filter means for extracting an analogue waveform from the synthesised waveform, and output means for producing an output pulse waveform from the extracted analogue waveform, which pulse generator includes subtraction means to which each number produced by the digital oscillator means is applied and which is operable to subtract from this number at least part of the previous number in said succession to produce a succession of difference numbers which are applied to the digital-to-analogue converter means, instead of the original numbers, for conversion into a modified synthesised waveform, said reconstruction filter means comprising an integrator for extracting the analogue waveform from the modified synthesised waveform.

5,070,255

MULTI-LEVEL SELECTING CIRCUIT

Yasuhiro Shin, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Dec. 27, 1990, Ser. No. 634,448
Claims priority, application Japan, Dec. 29, 1989, 1-343927
Int. Cl.[5] H03K *5/01, 3/01*
U.S. Cl. 307—268 **13 Claims**

1. A multi-level selecting circuit comprising:

selecting means provided in a semiconductor chip by a CMOS process for selecting one of a plurality of input levels at a time;

input terminals provided on said semiconductor chip for feeding a plurality of levels to said selecting means; and

an output terminal provided on said semiconductor chip for outputting one of the plurality of levels having been selected by said selecting means;

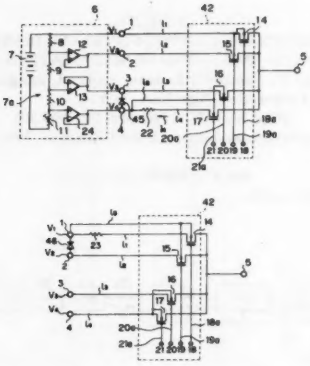
said selecting means comprising:

a plurality of MOS transistors each having a source electrode and a drain electrode and being provided in said semiconductor chip, said drain electrode of said MOS transistor being connected to said output terminal for feeding, when turned on by external control, the input level on said source electrode to said output terminal;

source connecting lines each being connected between respective one of said input terminal and said source electrode of respective one of said MOS transistors for feeding a voltage on said input terminal to said source electrode; and

a back-gate connecting line connected between said input

terminals and back-gates of said MOS transistors for feeding a predetermined voltage applied to said input terminals to said back-gates, said back-gate connecting line being substantially independent of said source connecting lines.

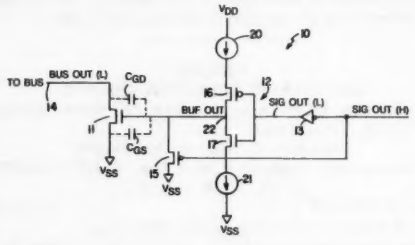


5,070,256

BUS TRANSMITTER HAVING CONTROLLED TRAPEZOIDAL SLEW RATE

David S. Grondalski, Cambridge, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 219,841, Jul. 8, 1988, abandoned, which is a continuation of Ser. No. 67,945, Jun. 29, 1987, abandoned.
This application Sep. 1, 1989, Ser. No. 403,900
Int. Cl.[5] H03K *3/01, 17/687, 19/094*
U.S. Cl. 307—270 11 Claims



1. A bus transmitter circuit comprising:

A. a driver including a MOSFET driver transistor having a drain terminal for connection to a bus line, a gate terminal connected to a control node and a source terminal for connection to a source power supply, said MOSFET driver transistor having a relatively high inherent capacitance between its drain terminal and its gate terminal which substantially dominates other capacitances at said gate terminal to thereby provide an internal feedback path between said drain terminal and said control node; and

B. a control buffer including a switched pull-up comprising a pull-up transistor and a pull-up current source, and a switched pull-down comprising a pull-down transistor and a pull-down current source, said pull-up transistor and said pull-down transistor being connected to said control node, said switched pull-up transistor and said switched pull-down transistor being further connected to receive a data input signal to control the control node of said driver in response to the condition of said data input signal, current through said pull-up transistor and said pull-down transistor to said control node being controlled by the respective current source to turn said driver on and off in a controlled manner,

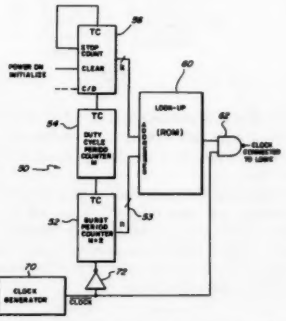
said internal feedback path providing a bidirectional path through said inherent capacitance for current flow between said control node and said bus to selectively control the voltage level of a signal at said control node and thereby control the rate at which said driver turns on and off in response to said data input signal.

5,070,257

CIRCUITRY FOR CONTROLLED RATE OF POWER APPLICATION TO CMOS MICROCIRCUITS

William D. Farwell, Thousand Oaks, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Sep. 28, 1990, Ser. No. 590,098
Int. Cl.[5] H03K *3/017, 19/003, 17/16, 3/013*
U.S. Cl. 307—296.3 11 Claims



1. Circuitry for controlled rate of power application to a complementary-metal-oxide-semiconductor (CMOS) microcircuit fabricated on an integrated circuit die which is attached to a substrate, and which is powered by a power supply voltage level, the microcircuit further characterized in that it is operated once the microcircuit has reached steady-state operation by a clock signal with an associated duty cycle operating at a predetermined steady-state rate, comprising:

means for controlling the number of gates transitioning per unit time during a warm-up period of predetermined length, thereby minimizing rapid transient temperature differentials between the microcircuit die and the substrate on which it is attached wherein said controlling means comprises means for changing the clock rate from zero at the commencement of application of the power supply voltage to the steady-state clock rate after the warm-up period.

5,070,258

INTEGRATED CIRCUIT HAVING METAL SUBSTRATE USED TO PROVIDE ELECTRICAL INDICATION OF OPERATION MODE OF CIRCUITS

Tomoji Izumi, Hatsukaichi; Nagahisa Fujita, and Yuichi Ito, both of Hiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Sep. 6, 1990, Ser. No. 578,232
Claims priority, application Japan, Sep. 7, 1989, 1-230312
Int. Cl.[5] H03K *3/26;* H03R *23/68*
U.S. Cl. 307—303 9 Claims

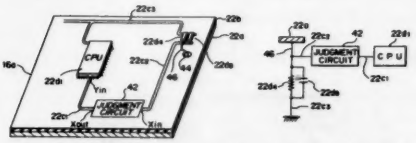
1. An integrated circuit which comprises:

a circuit board in which a conductive layer having a desired pattern is formed on a metal substrate through an insulating layer;

a circuit element mounted on said insulating layer, connected to the predetermined conductive layer, and com-

prising a logic processing unit having at least two different logic processing contents; and

judgment means, formed on said insulating layer, for discriminating on the basis of a potential of said metal substrate which one of at least two different logic processing modes is set,



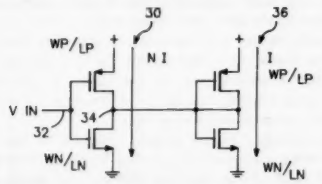
wherein said circuit element selectively switches and executes a logic processing operation corresponding to the logic processing mode discriminated by said judgment means from the at least two different logic processing contents.

5,070,259

CONSTANT CURRENT, HIGHSPEED, AUTO-ZEROED, CMOS COMPARATOR

William C. Rempfer, Santa Clara, and Robert C. Dobkin, Monte Sereno, both of Calif., assignors to Linear Technology Corporation, Milpitas, Calif.

Filed Dec. 26, 1989, Ser. No. 456,354
Int. Cl.[5] H03K *5/24, 17/14*
U.S. Cl. 307—350 **7 Claims**



1. A voltage comparator circuit including a gain element including a first CMOS transistor pair having a common gate input terminal and a common drain output terminal, a load connected to said common drain output terminal of said first CMOS transistor pair, said load comprising a second CMOS transistor pair having a common gate terminal and a common drain terminal connected to one another, wherein said first CMOS transistor pair and said second CMOS transistor pair are connectable between the same power supply terminals, said first CMOS transistor pair being configured to draw at least twice the current drawn by said second CMOS transistor pair for a null voltage input, and means interconnecting said output terminal of said first CMOS transistor pair and said common gate terminal and said common drain terminal of said second CMOS transistor pair.

5,070,260

ULTRAHIGH-RESOLUTION OPTICAL PARAMETRIC OSCILLATOR FREQUENCY MEASUREMENT AND SYNTHESIS SYSTEM

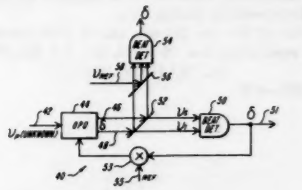
Ngai C. Wong, Arlington, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 12, 1989, Ser. No. 420,572
Int. Cl.[5] H03F *7/00*
U.S. Cl. 359—330 **23 Claims**

1. Optical apparatus comprising:

optical parametric oscillator means responsive to an input ultrastable pump beam at a frequency ν_p having a fractional stability $\Delta\nu_p/\nu_p$ and a linewidth $\Delta\nu_p$ for providing a pair of output signal and idler beams at frequencies ν_s and ν_i respectively, where the arithmetic sum of the frequencies ν_s and ν_i of the output signal and idler beams is constrained by an arithmetic sum constraint to be equal to the frequency ν_p of the input optical beam and where the frequencies ν_s and ν_i of the output signal and idler beams have fractional stabilities and linewidths at least equal to the fractional stability and linewidth of the input, ultrastable pump beam;

first beat detector means responsive to the output signal and idler beams for providing a first beat detection signal having a first frequency δ_1 of known sign, where the first



frequency δ_1 of the first beat detection signal is constrained by a first arithmetic difference constraint to be equal to the arithmetic difference of the frequencies ν_s and ν_i, and where the first beat detection signal has a linewidth equal to or better than the linewidth of the output signal and idler beams of frequencies ν_s and ν_i; and

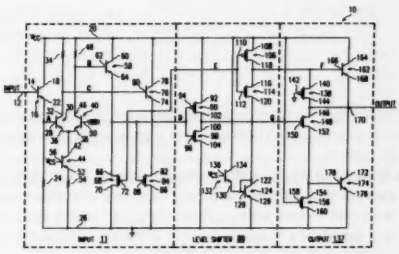
feedback means coupled between said beat detector means and said optical parametric oscillator means responsive to said first beat detection signal for locking said optical parametric oscillator means at said frequencies ν_s and ν_i of said signal and idler beams.

5,070,261

APPARATUS AND METHOD FOR TRANSLATING VOLTAGES

Timothy A. Ten Eyck, Sherman, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 4, 1990, Ser. No. 622,046
Int. Cl.[5] H03K *14/086, 14/0175*
U.S. Cl. 307—475 **19 Claims**



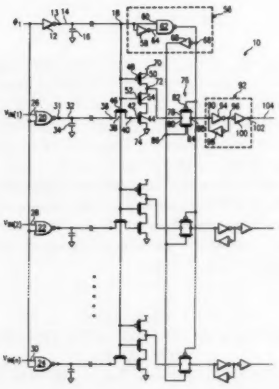
1. An apparatus for translating voltages comprising:

an input section for generating first and second control voltages within a voltage range responsive to an input signal;

a level shifter section comprising first and second inverters respectively coupled to said control voltages, said inverters comprising a plurality of transistors, wherein each transistor maintains current responsive to one of said control voltages being anywhere within said voltage range, such that outputs of said first and second inverters are operable to transition quickly responsive to a transition of said first and second control voltages, respectively; and

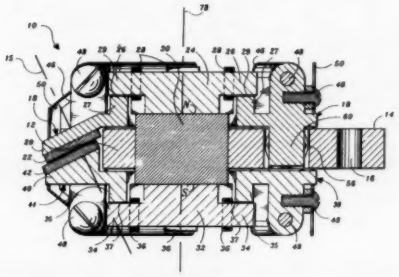
an output section for generating an output signal responsive to said outputs of said first and second inverters.

5,070,262
SIGNAL TRANSMISSION CIRCUIT
Masashi Hashimoto, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Continuation of Ser. No. 254,431, Oct. 6, 1988, abandoned. This application Jun. 20, 1990, Ser. No. 541,176
Int. Cl.[5] H03K *19/0175*
U.S. Cl. 307—475 **15 Claims**



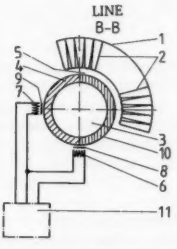
1. A signal transmission circuit, comprising:
a first transmission line segment having first and second ends; a gate having an output coupled to said first end of said first transmission line segment, a first input of said gate for receiving an input signal;
a control signal, a second input of said gate coupled to said control signal, said gate operable to output an inverse of said input signal to said first transmission line segment in response to receiving a predetermined value from said control signal;
a precharger coupled to a node for selectively precharging said note to a first voltage level representing a preselected bit value;
switching circuitry and a second voltage level supply, a current path of said switching circuitry operable to connect said second voltage level supply to said node, a control terminal of said switching circuitry coupled to said second end of said first transmission line segment for operating said switching circuitry;
a pulse circuit for generating a signal pulse in response to said control signal;
a pass gate operating in response to said signal pulse generated by said pulse circuitry, said pass gate having an input and an output, said input of said pass gate coupled to said node, a latch having an input coupled to said output of said pass gate, such that the state of said node is transmitted to said latch during a predetermined interval of time and stored by said latch; and
a second transmission line segment, an output of said latch coupled to said second transmission line segment for transmitting said state stored by said latch thereto.

5,070,263
COMPACT DUAL ROTOR TORQUE MOTOR FOR ACCELEROMETERS
Rand H. Hulsing, II, Redmond, Wash., assignor to Sundstrad Data Control, Inc., Redmond, Wash.
Filed Feb. 8, 1991, Ser. No. 652,505
Int. Cl.[5] H02K *33/12*; G01P *9/04*
U.S. Cl. 310—22 **21 Claims**



1. A torque motor comprising:
(a) a magnet having opposite first and second pole faces at which a magnetic field is evident;
(b) a first load that is magnetically linked to the first pole face of the magnet;
(c) a second load that is magnetically linked to the second pole face of the magnet;
(d) a base disposed proximate the first load and the second load, the base supporting the torque motor and fixed relative to the first and second loads;
(e) flexure means for elastically connecting the first and second loads to the base so that the first and second loads can move with respect to the base, the flexure means providing a spring biasing force that resists the motion of the first and second rotors; and
(f) electromagnetic coil means, attached to the base, for providing a magnetic field that interacts with the magnetic field of the magnet, thereby producing a torque causing the first and second loads to move in opposite directions relative to each other.

5,070,264
POSITION SENSOR
Armin Conrad, Herborn-Hörbach, Fed. Rep. of Germany, assignor to Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH, Asslar, Fed. Rep. of Germany
Filed Sep. 14, 1990, Ser. No. 582,246
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1989, 3930958
Int. Cl.[5] H02K *23/16*
U.S. Cl. 310—68 B **8 Claims**



1. In a brushless DC motor having a permanent magnetic rotor surrounded by a stator having windings and spaced from the rotor by an air gap, and further having means for driving

the stator windings including means for identifying the angular position of the rotor, the improvement comprising:

at least one coil having a magnetic core mounted in the air gap,

means for passing alternating current through the coil to establish a voltage across the coil,

means for intermittently magnetically saturating the core once per rotor revolution causing the voltage across the coil to change as a function of the revolutions of the rotor, and

means for using the changing voltage as a control signal for driving the stator windings.

6. A method for identifying the angular position of the rotor of a collectorless DC motor having a permanent magnetic rotatable rotor surrounded by a stator having windings and spaced from the rotor by an air gap, and further having means for driving the stator windings, comprising the steps:

(a) providing at least one coil having a soft magnetic core in the gap,

(b) providing on the rotor axial segment opposite the coil consecutive circumferential permanent magnetic and non-magnetic material portions, said permanent magnetic material forming a single pole producing a field which when adjacent the core will saturate the core once per rotor revolution,

(c) while the rotor is rotating, passing an alternating current through each coil to produce a voltage drop across the coil,

(d) sensing the change of the voltage drop at each coil which is caused in the course of one revolution of the rotor by the sequential passage of permanent magnetic material and non-magnetic material past the coil for identifying the angular position of the rotor.

5,070,265

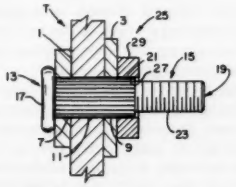
COMPRESSED SPACER FOR PERMANENT RETENTION OF ELECTRICAL MOTOR TERMINALS

Ronald D. Williams, St. Charles County, and William D. Crow, St. Louis County, both of Mo., assignors to Emerson Electric Co., St. Louis County, Mo.

Filed Oct. 23, 1990, Ser. No. 601,529

Int. Cl.[5] H02R *4/20*

U.S. Cl. 310—71 **5 Claims**



1. In a dynamoelectric machine having a terminal board, at least one opening in said terminal board, a fastener insertable through said opening, and at least one electrical element mounted to said fastener, said fastener including a head portion and a shank portion, at least one electrical element being positioned on said shank portion, the improvement comprising means for physically attaching the stud and electrical element to said board, said attaching means comprising a spacer fitter over the shank of said stud and compressible over the shank with sufficient force that the fastener cannot subsequently loosen from the terminal board.

5,070,266

ELECTROMECHANICAL DEVICE FOR STOPPING A SHAFT IN AT LEAST ONE POSITION

Christian Janczak, Schriesheim, and Richard Schopp, Heidelberg, both of Fed. Rep. of Germany, assignors to Teldix GmbH, Heidelberg, Fed. Rep. of Germany

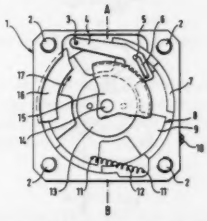
PCT No. PCT/EP88/00973, § 371 Date May 7, 1990, § 102(e) Date May 7, 1990, PCT Pub. No. WO89/04431, PCT Pub. Date May 18, 1989

PCT Filed Oct. 28, 1988, Ser. No. 466,328

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1987, 3737686

Int. Cl.[5] H02K *17/102*; B60K *41/08*

U.S. Cl. 310—77 **4 Claims**



1. Electromechanical device for stopping a shaft in at least one position, comprising an electromagnet, a locking pawl operable by means of the electromagnet, a component connected with the shaft which the locking pawl engages in its stop position and a spring which counteracts the force exerted on the locking pawl by the excited electromagnet, characterized in that the component is a toothed wheel connected to the shaft and the locking pawl is provided with corresponding toothing for engaging the toothed wheel, that a coil of the electromagnet is arranged coaxial to the shaft axis, that the coil is housed in a housing of permeable material having an E-shaped cross section, that at a central portion of the housing a rotational armature of permeable material is disposed which has at least one pole shoe, that at an interior face of a housing wall at least one pole shoe of permeable material is arranged on a plane with the rotational armature, with the pole shoes being arranged in such a way that their radial ends face one another while forming a small radial air gap, that between the rotational armature and the locking pawl there is a connection comprising a guide pin and a delimited guide slot, said connection being arranged in such a way that during a rotational movement of the rotational armature the locking pawl is moved radially and as a result, the locking pawl is brought out of or into its stopping position in accordance with the direction of the rotational movement and that the rotational movement of the rotational armature is delimited in such a way that an unexcited electromagnet causes the frontal faces of the pole shoes to overlap only slightly while an excited electromagnet causes them to overlap to a greater degree, although not completely.

5,070,267

LOW-NOISE ELECTRIC MOTOR ASSEMBLY FOR AUTOMOTIVE BLOWER

Takenosuke Sano; Keiichi Koike, both of Tokyo; Hajime Sato, Yokohama; Toshihiro Kimura, and Yutaka Enokido, both of Yokosuka, all of Japan, assignors to Calsonic Corporation, Tokyo and Nissan Motor Co., Ltd., Yokohama, both of, Japan

Filed Feb. 21, 1990, Ser. No. 482,938

Claims priority, application Japan, Feb. 22, 1989, 1-42727

Int. Cl.[5] H02K *13/00*

U.S. Cl. 310—89 **12 Claims**

1. An electric motor assembly for driving an air blower, comprising:

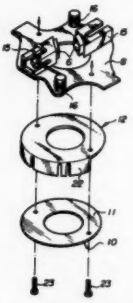
a metal casing having opposed open ends each closed by respective metal covers;

a rotation shaft rotatably disposed in said casing, one end of which is exposed to the outside of said casing through an opening formed in one of said covers and is connected to a fan of said air blower;

a plurality of magnets installed in said casing circumferentially surrounding the rotation axis of the shaft;

an armature mounted on said rotation shaft to rotate therewith;

a commutator mounted on said rotation shaft and electrically connected to said armature;



brushes operatively contacting said commutator and supported by said casing;

an electric power feeding means operatively connecting said brushes with an electric power source;

and a pulse width modulating device electrically connected to said power feeding means for pulse width modulating the electric power from said electric power source, said pulse width modulating device being installed completely in said casing to prevent radio noises produced by the pulse width modulating device from escaping to the surroundings.

5,070,268

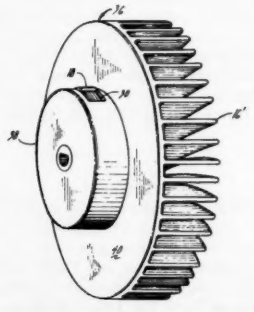
ROTOR OF A MAGNETOMOTIVE DEVICE

Russell D. Phelon, Wilbraham, Mass., and Ronald G. Brunelle, Ellington, Conn., assignors to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Continuation-in-part of Ser. No. 491,970, Mar. 12, 1990, Pat. No. 5,015,901. This application Oct. 1, 1990, Ser. No. 590,686

Int. Cl.[5] H02K *21/22, 9/04, 7/02, 21/12*

U.S. Cl. 310—153 **2 Claims**



1. A rotor for magnetomotive device for an internal combustion engine with a drive shaft and having a flux carrying core with pole shoes disposed on opposite sides of a permanent magnet, the improvement comprising an integral core member which includes a hub portion adapted to receive and be rotated by the shaft of said engine, a counterweight portion and a pair of radially extending, circumferentially spaced arm portions diametrically opposed by the counterweight portion of the core, each of the arm portions terminate at their outer ends in pole shoes having arcuate outer surfaces and configured to retain said magnet therebetween, said core being characterized by a configuration and distribution of mass so as to exert increasing clamping forces on opposite end portions of the permanent magnet with increased speeds of rotation of the rotor, the core and magnet assembly being disposed within a molded synthetic plastic material which forms the rotor, said core being dynamically independent of the structural strength of the plastic rotor, said rotor being of integral stepped construction defined by an inner portion having a cylindrical surface of predetermined outer diameter and a fan portion of substantially larger outer diameter than said inner portion, said magnet and core member being encapsulated within the inner cylindrical portion of the rotor such that said arcuate outer surfaces of said pole shoes correspond generally with said cylindrical surface of the inner portion, said inner portion and fan portion being axially contiguous.

5,070,269

MINIATURE MOTOR HAVING A FREQUENCY GENERATOR

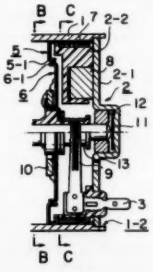
Jun Tamaki, and Nobuyuki Sata, both of Matsudo, Japan, assignors to Mabuchi Motor Co., Ltd., Chiba, Japan

Filed Jan. 16, 1990, Ser. No. 465,459

Claims priority, application Japan, Jan. 21, 1989, 1-5763[U]

Int. Cl.[5] H02K *19/20, 13/00*

U.S. Cl. 310—171 **5 Claims**



1. A miniature motor and frequency generator assembly, comprising: a stator equipped with a motor permanent magnet for forming a magnetic field; a rotor including rotor windings wound on a rotor core, said rotor core being mounted on a shaft for rotation; a housing part surrounding said stator and said rotor, said housing part including a housing part open end; a small case supporting part of a frequency generator including a frequency generator permanent magnet and a frequency-detecting coil for receiving changes in magnetic field, said small case also supporting a brush holder with current-feeding brushes; a frequency generator rotor mounted to said rotor on said shaft, said frequency generator rotor being formed of soft magnetic material including a plurality of magnetic pole serations on an outer periphery thereof; a frequency generator stator including a cylindrical portion contacting an inner circumferential surface of said motor housing, said frequency generator stator including a plurality of stator engaging portions, formed on an open end of said cylindrical portion, said plurality of stator engaging portions engaging an open-end edge formed on said motor housing, said frequency generator stator being fitted to said motor housing such that said stator cylindrical portion is press fit to said motor housing and said stator engaging portions engage with said motor housing open-end edge with said stator cylindrical portion surrounding a portion of said small case, said frequency generator stator having an inner periphery with a plurality of magnetic-pole serrations disposed facing said frequency generator rotor magnetic-pole serrations, said frequency-detecting coil being positioned adjacent said frequency generator stator for receiving

changes in magnetic field between said frequency generator rotor and said frequency generator stator magnetic-pole serrations and generating an induced voltage proportional to rotor revolution, brush holder being provided on an inner circumferential surface of said stator cylindrical portion; and, a commutator mounted adjacent said rotor for making sliding contact with said current-feeding brushes held by said brush holder, said brush holder being formed in a columnar shape with said frequency detecting coil wound around a columnar portion of said brush holder, said second frequency generator permanent magnet being installed on an inside wall of said small case.

5,070,270

BRUSH DEVICE

Hiroyuki Morikane, Hyogo, Japan, assignor to Mitsubishi Denki K.K., Tokyo, Japan

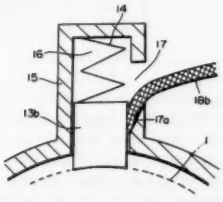
PCT No. PCT/JP88/00229, § 371 Date Oct. 26, 1988, § 102(e) Date Oct. 26, 1988, PCT Pub. No. WO88/06815, PCT Pub. Date Sep. 7, 1988

PCT Filed Mar. 1, 1988, Ser. No. 294,638

Claims priority, application Japan, Mar. 4, 1987, 62-31317

Int. Cl.[5] H02K *13/00*

U.S. Cl. 310—239 **3 Claims**



1. In a brush device including a brush to which is fixed a lead wire and which is in sliding contact with a commutator of a rotary machine, a brush spring for urging said brush to said commutator in a direction of movement of said commutator, and a brush holding frame having a receiving portion for receiving therein and holding said brush and said brush spring, and also having an opening sufficiently adequate to permit drawing out only of said lead wire, the improvement characterized in that an end portion of said frame on a commutator side of said opening is provided with a single continuous incline inwards of said receiving portion and in said direction of movement of said commutator, wherein said brush holding frame comprises a unitary, integrally molded thermosetting synthetic resin, and wherein said brush device comprises mounting means, fitted in said brush holding frame, for mounting and positioning an insulating plate on said brush holding frame.

5,070,271

MULTI-DIMENSIONAL ACOUSTIC CHARGE TRANSPORT DEVICE

Frederick Y. Cho, and Frederick M. Fliegel, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 5, 1990, Ser. No. 489,165

Int. Cl.[5] H01L *41/08*

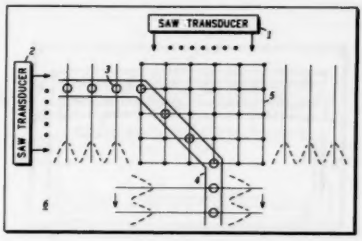
U.S. Cl. 310—313 R **16 Claims**

1. A multi-dimensional acoustic charge transport (ACT) device for greatly increasing the storage capacity of an input signal on a substrate of semiconductor material, said ACT device comprising:

said substrate of semiconductor material with an epitaxial layer including a channel for transmitting charge, said channel including an angular portion;

an input coupled to a first end of said channel for the transmission of charge packets representing said input signal through said channel; and

a plurality of surface acoustic wave (SAW) transducers for transmitting said charge packets of said input signal along said channel, said angular portion of said channel disposed at an acute angle with respect to a first of said transducers and disposed at a complementary angle to said acute angle with respect to a second of said transducers, said SAW



transducers simultaneously operating on said charge packets of said angular portion of said channel to transmit said charge packets angularly along said angular portion of said channel.

5,070,272

PHOTOCONDUCTIVE DEVICE AND METHOD OF OPERATING SAME

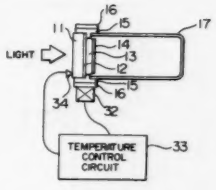
Takeshi Kikawa, Kokubunji; Kazutaka Tsuji; Kenji Sameshima, both of Hachioji; Tadaaki Hirai, Koganei; Junichi Yamazaki; Misao Kubota, both of Kawasaki, and Keiichi Shidara, Tama, all of Japan, assignors to Hitachi, Ltd. and Nippon Hoso Kyokai, Tokyo, Japan

Filed Jul. 3, 1990, Ser. No. 547,226

Claims priority, application Japan, Jul. 5, 1989, 1-171808

Int. Cl.[5] H01J *29/45*

U.S. Cl. 313—386 **17 Claims**



1. A photoconductive device comprising a transparent substrate having a layer made of an insulator of high thermal conductivity on at least part of the substrate; a transparent conductive film formed on the substrate; and a photoconductive film formed on the transparent conductive film.

5,070,273

LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMP WITH FLAT DISCHARGE VESSEL AND EXTERNAL SIDE ELECTRODES

Willem J. van den Bogert; Christianus J. Roozekrans, and Markus W. M. Wanninkhof, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 8, 1989, Ser. No. 308,359

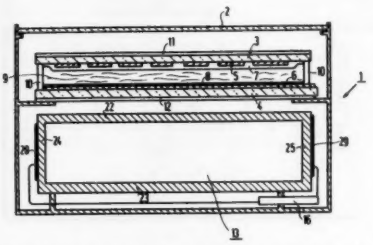
Claims priority, application Netherlands, Feb. 15, 1988, 8800478

Int. Cl.[5] H01J *61/35, 61/30*

U.S. Cl. 313—607 **18 Claims**

1. A low-pressure mercury vapour discharge lamp comprising a discharge vessel filled with mercury and a rare gas, said discharge vessel comprising two substantially parallel mainly rectangular glass plates which are located at a relatively short distance from each other and which are transparent to light,

side walls connecting said plates together in a gas-tight manner proximate their circumference, and electrodes between which a discharge is maintained in the discharge vessel during operation being arranged on the outer side of the discharge vessel, characterized in that the electrodes are strips of conducting



material which are arranged on at least two facing side walls and which extend substantially throughout the length of said two facing side walls, said side walls on which said electrodes extend being substantially flat and not intruding into said discharge space.

5,070,274

METHOD FOR MAKING DIAMOND AND APPARATUS THEREFOR

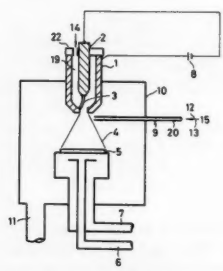
Masanori Yoshikawa, Yokohama; Haruo Tateno, Kiyose; Hiroshi Obana, Tokyo; Tsutomu Itoh, Musashino; Hiroshi Saitoh, Funabashi, and Masayuki Kitoh, Tokyo, all of Japan, assignors to Onoda Cement Company, Ltd., Onoda, Japan

Filed Mar. 20, 1990, Ser. No. 496,235

Claims priority, application Japan, Mar. 20, 1989, 1-67999

Int. Cl.[5] C01B *31/06*

U.S. Cl. 315—111.21 **20 Claims**



1. An apparatus for making a diamond comprising:

a plasma gas passageway, including means for feeding plasma gas to said passageway;

a pair of discharge electrodes comprising an anode and a cathode arranged in a concentric manner across said plasma gas passageway;

a hydrogen ion-source gas passageway, including means for feeding a hydrogen ion-source gas to said hydrogen ion-source gas passageway;

a power source adapted to generate an arc between said electrodes for generation of a plasma flame;

a plasma flame generating zone;

a substrate arranged so as to oppose the ends of said discharge electrodes across said plasma flame generating zone, said substrate including a cooling means; and

a raw material gas passageway, including means for feeding raw material gas or a mixture of raw material gas and a hydrogen ion-source gas to said raw material gas passageway, said raw material gas passageway being arranged in said plasma flame generating zone at a downstream side of the anode of said discharge electrodes, with the provison that said raw material gas passageway is not in communication with said plasma gas passageway.

5,070,275

ION IMPLANTATION DEVICE

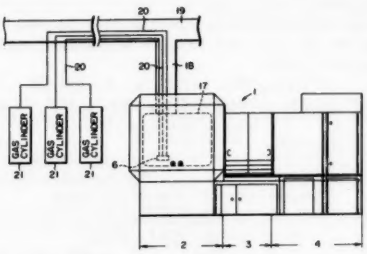
Shigehito Ibuka, Kofu; Hisashi Kondo, Yamanashi; Shigeru Sagami, and Koji Sumi, both of Tokyo, all of Japan, assignors to Tokyo Electron Limited, Tokyo, Japan

Filed Jun. 19, 1990, Ser. No. 540,117

Claims priority, application Japan, Jun. 29, 1989, 1-168088

Int. Cl.[5] H01J *27/02*

U.S. Cl. 315—111.81 **5 Claims**



1. An ion implantation device, wherein an ion is generated from a predetermined source gas in an ion source and the ion is irradiated on a processing material in a form of a beam, wherein said ion source is provided within an enclosure, and wherein said source gas is supplied to said ion source from a gas cylinder provided outside said enclosure.

5,070,276

LAMP SUPPLY CIRCUIT

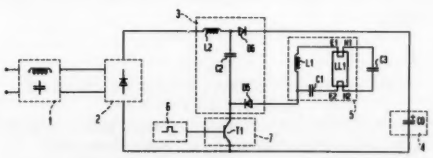
Alwin Burgholte; Udo Schuermann, both of Wilhemshaven; Warner Hieronimus, Rhauderfehn, and Horst Horneborg, Detern, all of Fed. Rep. of Germany, assignors to Heinrich Korte, Fed. Rep. of Germany

Filed Mar. 13, 1990, Ser. No. 492,457

Claims priority, application European Pat. Off., Mar. 16, 1989, 89104702.9

Int. Cl.[5] H05B *41/24*

U.S. Cl. 315—209 R **15 Claims**



1. A supply circuit for high-frequency operation of a low-pressure discharge lamp or several low-pressure discharge lamps connected in parallel, wherein the supply circuit comprises

a power rectifier followed by:

an active harmonic oscillation filter; and

a filter capacitor additional thereto, and

a single-phase high-frequency generator comprising a switching transistor, a switching inductance and an oscillating capacitor,

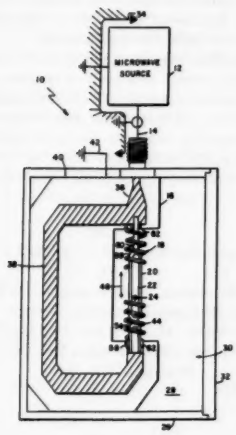
said generator being supplied from said filter capacitor and being decoupled from a power supply by two decoupling diodes.

5,070,277

ELECTRODLESS HID LAMP WITH MICROWAVE POWER COUPLER

Walter P. Lapatovich, Marlboro, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 15, 1990, Ser. No. 524,265
Int. Cl.[5] H05B *41/16*
U.S. Cl. 315—248 **28 Claims**



10. A microwave powered lamp comprising:

a) a first helical coupler receiving input microwave power at a first end, and having a second end facing a gap,

b) a second helical coupler positioned coaxial with the first helical coupler, receiving input microwave power at a first end, and having a second end facing the gap and facing the second end of the first coupler, and

c) a lamp capsule having an enclosed volume having an internal length approximately equal to one quarter of the compressed wavelength of the input power, including a lamp fill excitable to light emission on the application of microwave power, positioned in the gap between the first coupler and the second coupler.

5,070,278

DISCHARGE TUBE ARRANGEMENT

Colin J. Seymour, South Harrow; Martin C. Steel, Reading, and Francis R. Trumble, Marlow Bottom, all of England, assignors to Thorn EMI plc, London, England

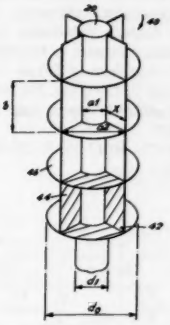
Filed Apr. 16, 1990, Ser. No. 509,548
Claims priority, application United Kingdom, Apr. 15, 1989, 8908604
Int. Cl.[5] H05B *41/16*
U.S. Cl. 315—248 **6 Claims**

1. A discharge tube comprising:

a discharge tube containing a fill;

means for generating a discharge in the fill from a source of radio frequency (r.f.) power;

and an electrically conductive structure mounted on and surrounding the discharge tube wherein said structure comprises a plurality of waveguides extending outwardly from the discharge tube, said waveguides defining spaces each having a cross-sectional area that increases from a position adjacent the discharge tube to a radially outward position, each waveguide being dimensioned to support



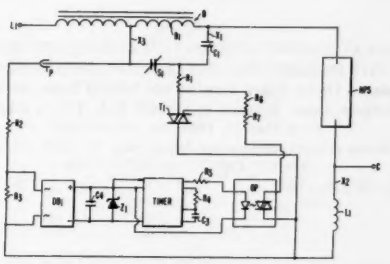
the propagation of electromagnetic radiation above a cut-off frequency.

5,070,279

LAMP IGNITOR WITH AUTOMATIC SHUT-OFF FEATURE

Glenn D. Garbowicz, Rosemont, and Seymour Perkins, III, Hinsdale, both of Ill., assignors to North American Philips Corporation, New York, N.Y.

Filed Jul. 25, 1990, Ser. No. 557,890
Int. Cl.[5] H05B *41/14*
U.S. Cl. 315—289 **19 Claims**



1. Auxiliary equipment for operating an electric discharge lamp comprising:

a magnetic ballast, having a tapped winding, which is connected in series with the discharge lamp and a source of AC line voltage;

ignitor circuit means connected to provide ignition pulses across a tapped portion of said winding whereby high voltage ignition pulses are coupled to the lamp;

timer means connected to activate and deactivate the ignitor means so that ignition pulses are only generated during a predetermined time period after a reset signal is applied to an input of said timer means;

means for electrically isolating the output of said timer means from said ignitor circuit means;

means for applying said reset signal to said input of said timer means upon application of line voltage to said auxiliary equipment; and

means for manually resetting the timer means after a hot relamping operation.

5,070,280
DEFLECTION YOKE

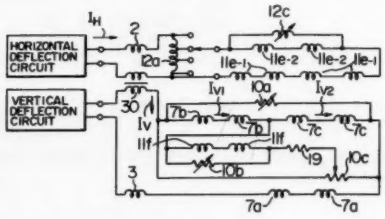
Nobutaka Okuyama; Soichi Sakurai; Kouji Kitou, all of Yokohama; Michitaka Ohsawa, Fujisawa; Ichiro Niitsu, Yokohama; Hiroshi Yoshioka, Mobara; Atushi Takeyama, Odawara; Masao Obara, Yokohama, and Isao Yoshimi, Mobara, all of Japan, assignors to Hitachi, Ltd. and Hitachi Mizusawa Elec. Co Ltd, both of Tokyo, Japan

Filed Aug. 9, 1990, Ser. No. 564,609

Claims priority, application Japan, Aug. 25, 1989, 1-217375; Feb. 7, 1990, 2-026050

Int. Cl.[5] H01J *29/70, 29/76*

U.S. Cl. 315—368.11 **10 Claims**



1. A deflection yoke for a color cathode ray tube in which multiple electron beam arranged in line along an electron beam arrangement axis are formed, comprising:

a ring magnetic sub-core having a plurality of protrusions which extend toward a center axis, said magnetic sub-core being provided adjacent to an electron gun side of a main deflection yoke consisting of a horizontal deflection coil, a vertical deflection coil, and a main magnetic core; and

auxiliary vertical deflection coils connected in series with said vertical deflection coil and wound around protrusions of said magnetic sub-core, wherein said auxiliary vertical deflection coils generate an uneven vertical sub-deflection magnetic field.

5,070,281
DISPLAY HAVING AUTOMATIC CORRECTION DEVICE FOR HORIZONTAL DEFLECTION DISTORTION

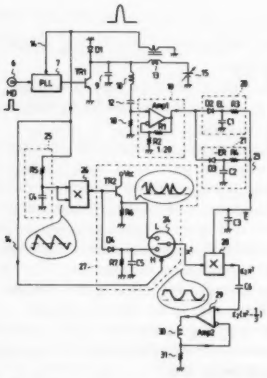
Masanori Ogino; Takeo Yamada, and Miyuki Ikeda, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 21, 1990, Ser. No. 525,667

Claims priority, application Japan, May 29, 1989, 1-132605

Int. Cl.[5] G09G *1/04;* **H01J** *29/70*

U.S. Cl. 315—370 **8 Claims**



1. A CRT display with a horizontal deflection circuit comprising:

deflection coil means for deflecting an electron beam in the horizontal direction;

means for detecting a current flowing through said deflection coil means;

means for detecting a deflection distortion component included in the signal detected by said current detection means; and

auxiliary coil means through which a deflection distortion correcting current corresponding to the output of said deflection distortion detection means is flowed for correcting the horizontal deflection of said electron beam caused by said deflection coil means;

wherein said deflection distortion detection means is formed of a detection means of a peak of positive polarity and a detection means of a peak of negative polarity connected in parallel, one terminal of said means connected in parallel being supplied with the detected current from said current detection means and the other terminal thereof providing an average of the peak values of both polarities.

5,070,282
AN ELECTRON SOURCE OF THE FIELD EMISSION TYPE

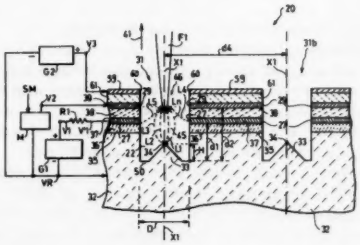
Bernard Epsztein, Sceaux, France, assignor to Thomson Tubes Electroniques, Boulogne Billancourt, France

Filed Dec. 18, 1989, Ser. No. 451,790

Claims priority, application France, Dec. 30, 1988, 88 17484

Int. Cl.[5] H01J *29/52*

U.S. Cl. 315—383 **9 Claims**



1. An electron source producing electrons which are intended to constitute at least one electron beam, comprising at least one electron-emitting device of the field emission type, the emitter device being provided with an electron-emissive point brought to a reference potential, an extracting electrode brought to a positive extraction potential with respect to the reference potential, the extracting electrode being provided with a hole for the passage of electrons emitted by the emissive point, wherein the emitter device is provided in addition with at least one control electrode placed downstream of the extracting electrode with respect to the direction of propagation of the beam, the control electrode being brought to a negative control potential with respect to the extracting electrode, and wherein means for accelerating the beam are placed downstream of the control electrode, and wherein the emissive point and the extracting and control electrodes are carried by one and the same substrate, and wherein the extracting and control electrodes are constituted by a succession of insulating and conductive layers deposited on the substrate and etched so as to constitute a well in which the emissive point is located.

5,070,283
TRACTION MOTOR CONTROLLER FOR FORKLIFT VEHICLES

Isaac Avitan, Vestal, N.Y., assignor to Raymond, Greene, N.Y.

Filed May 7, 1990, Ser. No. 519,987

Int. Cl.[5] H02P *7/06*

U.S. Cl. 318—139 **10 Claims**

1. Apparatus for decoupling speed and torque of a dc motor

having separately excited armature and field windings, said apparatus controlling motor speed of said dc motor independently of torque and torque independently of dc motor speed to the limit of the dc motor commutation curve, in combination, comprising:

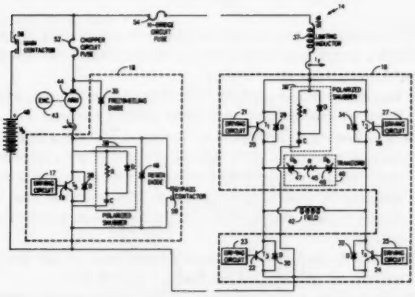
a) a dc motor having an armature, an armature winding and a field winding, said armature and field windings being independently controlled;

b) armature voltage amplifying means operatively connected to the armature of said motor for varying voltage applied thereto;

c) armature current sensing means directly connected to said armature voltage amplifying means for sensing armature current;

d) field voltage amplifying means operatively connected to the field winding of said motor for varying voltage applied thereto;

e) motor speed sensing means operatively connected to said armature of said dc motor for generating a signal representative of rotational speed of said motor armature; and



f) decoupling control means being operatively connected to said motor speed sensing means, to said armature voltage amplifying means and to said field voltage amplifying means for independently controlling the motor speed independently of torque and torque independently of said motor speed to the limit of the commutation curve of said dc motor.

10. A method for controlling the speed and torque of a dc motor independently of each other to the limit of the commutation curve of said dc motor, comprising the steps of:

a) generating signals representative of desired motor speed and armature current;

b) generating signals representative of actual motor speed and armature current;

c) generating a filtered input reference signal in conjunction with said generated signals of steps (a) and (b);

d) generating a conditioned motor output signal responsive to said generated signals of steps (a) and (b); and

e) controlling dc motor speed and torque independently of each other to the limit of said commutation curve of said dc motor as a function of said filtered input reference signal and said conditioned motor output signal.

5,070,284

FAIL-SAFE VARIABLE DAMPING SUSPENSION FOR A MOTOR VEHICLE

Prabhakar B. Patil, Southfield; John M. Miller, Saline, and Md. A. Masrur, West Bloomfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

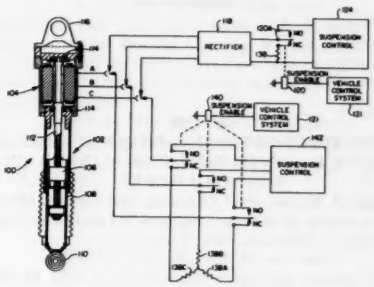
Filed Jan. 14, 1991, Ser. No. 640,719
Int. Cl.[5] B60G *17/015*
U.S. Cl. 318—362 **20 Claims**

1. A fail-safe variable damping suspension for a motor vehicle having sprung and unsprung masses comprising:

a permanent magnet rotary electric machine;

a ball screw and nut apparatus connecting the sprung and unsprung masses and rotating with said machine in alternate rotary directions as the sprung and unsprung masses move relative to one another;

controller means for providing varying control for said machine to vary the damping rate of the suspension; and



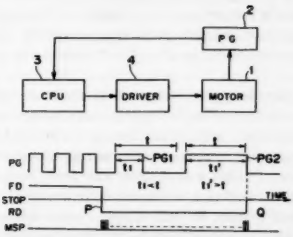
switch means for connecting said controller means to said machine, said switch means, in the event of failure of the suspension, connecting a defined load to said machine to define a fail-safe damping rate for said suspension.

5,070,285

MOTOR STOP CONTROL DEVICE

Daiji Yamane; Nobuyuki Horie; Aisaku Taguchi, and Teruki Sugiura, all of Yamatokoriyama, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 2, 1989, Ser. No. 305,406
Claims priority, application Japan, Feb. 5, 1988, 63-26266
Int. Cl.[5] G05B *5/00*
U.S. Cl. 318—461 **6 Claims**



1. A motor control for stopping a rotor rapidly in response to a stop command signal comprising:

a pulse generator for detecting the rotation of a motor and for generating a pulse signal having a frequency relative to the rotational speed of the motor;

a driver for driving the motor at least in three different modes which generate, in a first mode a first direction driving torque, in a second mode a second direction driving torque, and in a third mode applying no torque;

pulse width detecting means for detecting a pulse width of the pulse signal;

storing means for storing a pulse width of a pulse signal obtained in a previous cycle;

comparator means for comparing a pulse width obtained in a present cycle with a pulse width obtained in a previous cycle, and for producing a terminating signal when said present pulse width is smaller than said previous pulse width;

control means for controlling said driver such that in response to the receipt of a stop command, said driver drives said motor to generate said second direction driving

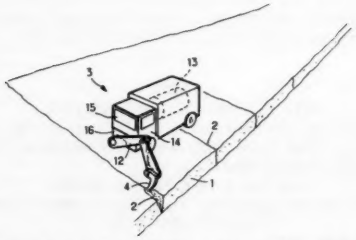
torque, and thereafter in response to said terminating signal, said driver drives said motor to generate no torque.

5,070,286

MANIPULATOR FOR PUBLIC WORKS MACHINES AND MACHINE EQUIPPED WITH SUCH MANIPULATOR FOR ROAD WORKS

Paul Soulard, Brissac; Paul Chassaing, and Georges Moreau, both of Angers, all of France, assignors to Laboratoire Central des Ponts et Chaussees, Paris, France

Filed Nov. 15, 1989, Ser. No. 437,357
Claims priority, application France, Nov. 15, 1988, 88 14828
Int. Cl.[5] E02F *5/30*
U.S. Cl. 318—568.1 **11 Claims**



1. A manipulator for a public works machine comprising at least one arm having a first end and a second end, said first end being pivotably supported on a chassis of the public works machine and said second end being provided with a tool mounted to rotate about an axis of said second end of said arm; and,

control means for positioning said manipulator and said tool;

wherein said manipulator comprises a command beam and a follower beam, each beam having a rear end and a forward end, said command beam being pivotable at the rear end thereof about a first pivot axis fixed with respect to said chassis and said command beam further being pivotable with respect to said follower beam about a second pivot axis common to both beams, the forward end of said follower beam being provided with a cradle mounted to rotate thereon about a third pivot axis;

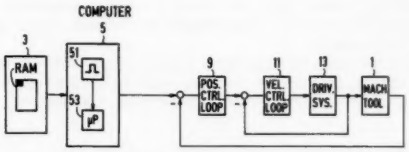
wherein each beam includes a means for detecting the angle of rotation thereof, and a rotative motor supported by the forward end of the respective beam with the rotative motor of the command beam being supported by said command beam to provide rotation of said follower beam and the rotative motor of said follower beam being supported by said follower beam to provide rotation of said cradle, transmission means on each beam between the detecting means and the rotative motor of the respective beam, the transmission means of the command beam controlling the rotation of the follower beam as a function of the angle of rotation of the command beam as detected by the detecting means thereof, and the transmission means of the follower beam controlling the rotation of the cradle as a function of the angle of rotation of the follower beam as detected by the detecting means thereof, and a further rotative motor mounted to rotate the command beam about the first pivot axis.

5,070,287

METHOD FOR A NUMERICAL POSITIONING CONTROL SYSTEM

Manfred Boehm, Pretzfeld, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 27, 1990, Ser. No. 589,340
Claims priority, application European Pat. Off., Sep. 27, 1989, 89117901.2
Int. Cl.[5] G05B *19/407*
U.S. Cl. 318—569 **12 Claims**



1. A method for the numerical positioning of driving systems to reach a target point (P0) with a predetermined final velocity (v_{END}) comprising the steps of:

a) successively approaching predetermined positions, which lie on at least a one-dimensional path of motion;

b) determining an approach acceleration (a_1) for a first calibration time ((k−1)·T), which occurs before a minimum time (t_{MIN}), wherein the minimum time (t_{MIN}) is a time required to reach the target point (P0) with the final velocity (v_{END}) when employing a maximum acceleration (a_{MAX});

c) applying said approach acceleration (a_1) to the driving system up to a second calibration time (k·T);

d) determining a final acceleration (a) for the second calibration time (k·T);

e) applying said final acceleration (a) to the driving system until the target point (P0) is reached; and

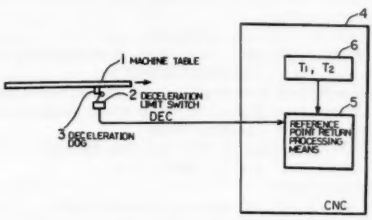
f) selecting said approach acceleration (a_1) and final acceleration (a) to reach the target point (P0) with the final velocity (v_{END}) exactly at an integral multiple of the calibration time (n·T).

5,070,288

REFERENCE POINT RETURN SYSTEM

Yoshiaki Ikeda, Minamitsuru; Mitsuru Kuwasawa, Gotenba, and Kenichi Ito, Minamitsuru, all of Japan, assignors to Fanuc Ltd., Minimatsura, Japan

PCT No. PCT/JP89/00998, § 371 Date May 31, 1990, § 102(e) Date May 31, 1990, PCT Pub. No. WO90/04815, PCT Pub. Date May 3, 1990
PCT Filed Sep. 29, 1989, Ser. No. 476,416
Claims priority, application Japan, Oct. 20, 1988, 63-264873
Int. Cl.[5] G06F *15/46;* **G05B** *11/18*
U.S. Cl. 318—618 **4 Claims**



1. A system for carrying out a reference point return in a numerical control device, comprising:

a deceleration dog having a short length and arranged at a machine table;

a deceleration limit switch operated by the deceleration dog, for generating only a deceleration start signal;

means for storing a deceleration end signal beforehand;

circuit means for setting a deceleration time, starting with the generation of the deceleration start signal and ending with the generation of the deceleration end signal, and a slow-speed travel time; and

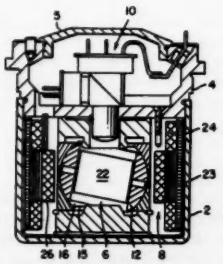
reference point return processing means for starting a deceleration of the machine table in response to the deceleration start signal, and stopping the machine table at a first electrical grid point reached by the machine table after the deceleration time and slow-speed travel time have elapsed, to thereby carry out a reference point return.

5,070,289

MINIATURE TACTICAL ANGULAR RATE SENSOR

Joseph Pona, Jr., Bayonne, N.J., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Mar. 2, 1990, Ser. No. 487,097
Int. Cl.[5] G05B *17/00*
U.S. Cl. 318—640 **6 Claims**



1. A two degree of freedom angular rate sensor, comprising:

a spherical rotor and a housing having a matching spherical cavity within which the rotor is suspended;

a two pole cylindrical permanent magnet mounted to the spherical rotor suspended within the spherical cavity through the center of the rotor;

means for hydrodynamically suspending the spherical rotor within the matching housing cavity;

means arranged with the suspended spherical rotor for rotating said rotor, including a motor having a rotor element which is the two pole cylindrical permanent magnet mounted to the spherical rotor suspended within the spherical cavity, and a stator element, said stator element carrying a plurality of coil segments surrounding the rotor element so as to be in magnetically cooperative relation therewith;

means arranged with the rotating suspended spherical rotor for sensing the position thereof due to angular rates sensed by the sensor about two mutually perpendicular output axes and for providing corresponding output signals;

means arranged with the rotating suspended spherical rotor for positioning said rotor so that said output signals are at null, including a torquer having a torquing element which is the two pole cylindrical permanent magnet mounted to the spherical rotor, and a single annular torquer winding carried by the stator element and surrounded by the plurality of coil segments, and the torquer winding surrounding the torquing element so as to be in magnetically cooperative relation therewith; and

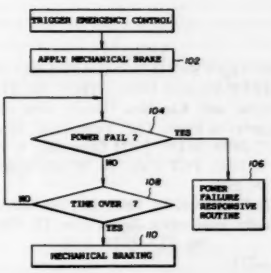
means arranged with the position sensing means and with the rotor positioning means for energizing said rotor positioning means commensurate with the sensed angular rates to maintain the output signals at null including the torquer winding arranged with said means arranged with said position sensing means and with said rotor positioning means and affecting the rotor positioning means for positioning the rotor commensurate with the sensed angular rates to maintain the output signals at null.

5,070,290

ALTERNATING CURRENT MOTOR CONTROL SYSTEM WITH EMERGENCY CONTROL RESPONSIVE TO FAILURE OF POWER SUPPLY

Masao Iwasa, Chiba, and Masayuki Mori, Aichi, both of Japan, assignors to Otis Elevator Company, Farmington, Conn.

PCT No. PCT/JP88/00479, § 371 Date Mar. 13, 1989, § 102(e) Date Mar. 13, 1989, PCT Pub. No. WO88/09584, PCT Pub. Date Dec. 1, 1988
PCT Filed May 20, 1988, Ser. No. 314,356
Claims priority, application Japan, May 20, 1987, 62-124959
Int. Cl.[5] H02P *3/26*
U.S. Cl. 318—758 **20 Claims**



1. A control system supplied by a fixed frequency alternating current (AC) source (**10**) for controlling an AC machine (**40**) in a motor mode in which variable frequency AC is supplied thereto and a generator mode in which nonfixed frequency AC is generated therein, comprising:

first means (**20**), connected to said fixed frequency AC source, for converting said fixed frequency AC to DC in said power mode and for converting DC to fixed frequency AC for supply to said source in said generator mode;

second means (**30**), connected to said first means to receive DC therefrom, in said motor mode, and responsive to a variable speed control signal (**50*a***), for converting said DC to AC of a controlled frequency and amplitude for supply to said AC machine;

third means (**58** or **66**) responsive to the level of current or the level of voltage exceeding a predetermined level in said first means in said generator mode for providing a dynamic braking signal for commencing dynamic braking;

fourth means (**35**), associated with said AC machine or its load (**34**), for applying a mechanical brake (**35*a*, 35*b***) thereto in response to a mechanical braking signal (**36**); and

fifth means (**50**) for providing said variable speed control signal for controlling said second means to drive said motor at an adjustable speed in said motor mode and, in response to a power failure signal at a time T_0, for preventing said first means from providing said fixed frequency AC to said source and for reducing the magnitude of said controlled frequency AC to a predetermined minimum limit low enough to maintain a synchronous relationship between said controlled frequency AC and said machine for a selected period (T_D) and, after said period elapses, for causing said third means to provide said dynamic braking signal for slowing said machine (for a period from t_2 to t_5) and thereafter supplying said mechanical braking signal, and, on the other hand, during said generator mode, in response t one of current level and voltage level in said first means exceeding said predetermined level, for providing said braking signal for activating said

fourth means at an initial braking torque level and then monitoring (104, 108) said power source for detecting power failure during a timed period while said fourth means being so activated, said fifth means preventing said first means from providing said fixed frequency Ac and for reducing the magnitude of said controlled frequency AC to said predetermined minimum level for said selected period (T_D) when power failure is detected while said fourth means being so activated, and, after said timed period expires, otherwise controlling said fourth means for adjusting braking torque of said mechanical brake at a torque level greater than said initial braking torque level for decelerating said motor to stop.

5,070,291

CONNECTION SWITCHING APPARATUS FOR THREE-PHASE INDUCTION MOTOR

Kosei Nakamura, and Kazuhisa Numai, both of Yamanashi, Japan, assignors to Fanuc Ltd., Yamanashi, Japan

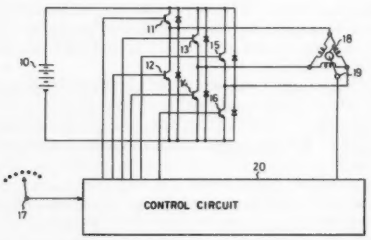
PCT No. PCT/JP88/01277, § 371 Date Aug. 4, 1989, § 102(e) Date Aug. 4, 1989, PCT Pub. No. WO89/06065, PCT Pub. Date Jun. 29, 1989

PCT Filed Dec. 16, 1988, Ser. No. 393,918

Claims priority, application Japan, Dec. 17, 1987, 62-317472

Int. Cl.[5] H02P *7/48*

U.S. Cl. 318—771 **3 Claims**



1. A driving apparatus for a three-phase induction motor comprising:

an inverter for converting direct current into a three-phase alternating current having a variable frequency to be supplied to said three-phase motor;

a rotational speed setting means for setting a target rotational speed of said three-phase induction motor;

an inverter control circuit connected to said inverter and said rotational speed setting means for controlling the frequency of said three-phase alternating current so that a rotational speed of said three-phase induction motor coincides with said target rotational speed; and

a connection switching circuit connected to said inverter and said inverter control circuit having a first switch group and a second switch group, and forming a delta connection for said three-phase induction motor by switching off said first switch group and switching on said second switch group when said target rotational speed set by said rotational speed setting means is greater than a pre-set value, and forming a star connection for said three-phase induction motor by switching on said first switch group and switching off said second switch group when said target rotational speed set by said rotational speed setting means is less than said pre-set value, said first and second switch groups having semiconductor switches.

5,070,292

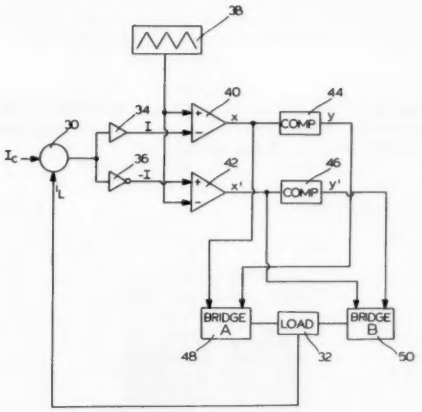
PULSE-WIDTH MODULATED CIRCUIT FOR DRIVING A LOAD

Jerry K. Goff, Doylestown, Pa., assignor to Performance Controls, Inc., Horsham, Pa.

Filed Nov. 13, 1989, Ser. No. 435,258

Int. Cl.[5] H02P *5/00*

U.S. Cl. 318—811 **20 Claims**



1. A circuit for providing a current through a load, the current being generated by a power supply having a predetermined maximum voltage, the current through the load being determined by a command signal, the circuit comprising:

(a) means for converting the command signal into a first train of pulses, the pulses of the first train having a width which is representative of the value of the command signal, the first train of pulses being called signal x,

(b) means for inverting the command signal, and for converting the inverted command signal into a second train of pulses, the pulses of the second train having a width which is representative of the value of the command signal, the second train of pulses being called signal x',

(c) means for providing a signal which is the complement of signal x, the latter being called signal y,

(d) means for providing a signal which is the complement of signal x', the latter being called the signal y',

(e) a pair of bridge circuits, the first bridge circuit including four switching means, two of the switching means being controlled by signal x and two of the switching means being controlled by signal y, the second bridge circuit also including four switching means, two of the switching means of the second bridge circuit being controlled by signal x' and two of the switching means of the second bridge circuit being controlled by signal y',

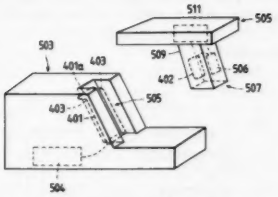
(f) the load being connected to both bridge circuits such that the load receives pulses of voltage applied through electrical paths formed in the bridges, wherein the first bridge is connected across two terminals extending from the load, and wherein the second bridge is connected across the same two terminals, wherein both the first and second bridges are connected to each other at the same terminals which extend from the load, wherein the pulses of voltage are of a frequency which is substantially double the frequency of pulses of signal x, and wherein the magnitude of the peak-to-peak voltage across the load is no greater than the magnitude of the maximum voltage of the power supply.

5,070,293

ELECTRIC POWER TRANSMITTING DEVICE WITH INDUCTIVE COUPLING

Naoki Ishii, Handa; Toshikazu Ina, Nagoya; Koji Mori, Oobu; Katsunori Ito, Aichi, and Shigenori Asai, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan and Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 2, 1990, Ser. No. 487,032
Claims priority, application Japan, Mar. 2, 1989, 1-50544
Int. Cl.[5] H02J *7/04;* **H01M** *10/46;* **H01F** *27/28*
U.S. Cl. 320—2 **11 Claims**



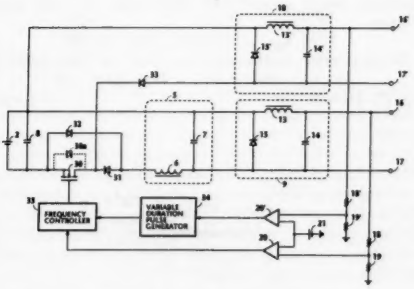
1. An electric power transmitting device comprising:
a first coil;
a second coil which can be combined with said first coil to provide an inductive coupling therebetween;
means for supplying a current which is variable in magnitude with time to said first coil to induce an electric current across said second coil through said inductive coupling;
one of said first and second coils having a bent portion extending along the axial direction of one of the coils;
the other of said first and second coils being insertable into said one of the coils through said bent portion; and
the arrangement being such that said first and second coils can be disposed in substantially one plane, and said other of the coils can be moved into and out of said one of the coils in the axial direction of said one of the coils and in a direction transverse to said axial direction.

5,070,294

MULTI-OUTPUT DC-DC CONVERTER USING FIELD-EFFECT TRANSISTOR SWITCHED AT HIGH FREQUENCY

Hideo Nochi, Fukushima, Japan, assignor to NEC Corporation, Japan

Filed Jan. 22, 1991, Ser. No. 643,792
Claims priority, application Japan, Jan. 19, 1990, 2-9718
Int. Cl.[5] G05F *1/577*
U.S. Cl. 323—267 **2 Claims**



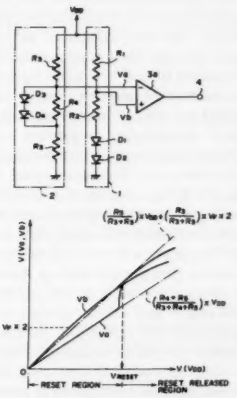
1. A multi-output DC-DC converter comprising:
a field-effect transistor having a source-drain path connected to a first terminal of an input DC voltage source, said transistor having a parasitic diode coupled in parallel relationship therewith;
a resonant circuit coupled at one end to a second terminal of said DC voltage source;
a first diode connected between the source-drain path of said transistor and the other end of said resonant circuit to allow current to flow therein in a forward direction;
a second diode connected in parallel with a series circuit formed by the source-drain path of said transistor and said first diode to allow current to flow in a reverse direction, said second diode having a recovery time much smaller than the recovery time of said parasitic diode;
first rectifier-filter means coupled to said resonant circuit for developing a first DC output voltage;
second rectifier-filter means coupled across the first and second terminals of said DC voltage source through said transistor for developing a second DC output voltage;
a third diode connected between said DC voltage source and said second rectifier-filter means for blocking a current flow which would otherwise flow through said first and second diodes and said second rectifier-filter means;
means for detecting deviations of said first and second DC output voltages respectively from a reference voltage; and
means for supplying to the gate of said transistor switching pulses having a frequency variable as a function of the deviation of said first DC output voltage and having a duration variable as a function of the deviation of said second DC output voltage.

5,070,295

POWER-ON RESET CIRCUIT

Takashi Morigami, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 18, 1991, Ser. No. 687,387
Claims priority, application Japan, Apr. 20, 1990, 2-104462
Int. Cl.[5] G05F *3/24*
U.S. Cl. 323—314 **5 Claims**



1. A power-on reset circuit comprising:
a first and a second power supply terminal;
a first reference potential circuit including a first resistor, a second resistor and a first non-linear resistor element circuit all connected in series between said first and said second power supply terminal, said first and said second resistor having a node forming an output terminal;
a second reference potential circuit including a third resistor, a fourth resistor and a fifth resistor all connected in series between said first and said second power supply terminal and a second non-linear resistor element circuit connected in parallel with said fourth resistor, said third and fourth resistors having a node forming an output terminal; and

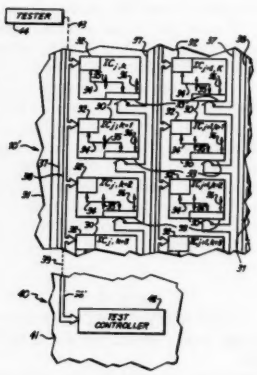
a comparator circuit whose input terminals are connected to said output terminals of said first and said second reference potential circuit.

5,070,296

INTEGRATED CIRCUIT INTERCONNECTIONS TESTING

Gordon W. Priebe, Maple Grove, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 22, 1990, Ser. No. 542,455
Int. Cl.[5] G01R *31/00*
U.S. Cl. 324—73.1 **20 Claims**



1. A test system for testing interconnections extending at least in part along a surface of a structure to one or more integrated circuits mounted on that structure, said test system comprising:

a first integrated circuit mounted on said structure with a first said interconnection extending to a first input signal region therein, said first integrated circuit having both operating circuits and test circuits contained therein electrically connected to said first input signal region with at least a first portion of said test circuits being capable of being selected by control signals provided at a control signal region in said first integrated circuit to retain therein at least temporarily one or more portions of input signals provided at said first input signal region, said test circuits further being capable of providing response signals at least at one output signal region of said first integrated circuit in response to input signals retained in said test circuits first portion from said first input signal region, said test circuits first portion having therein a switchable resistance means electrically connected between said first input signal region and a first selected source of voltage and being additionally capable, if selected, of switching said switchable resistance means from being substantially an open circuit between said first input signal region and said first selected source of voltage to providing a selected resistance value therebetween in response to said control signals;

a test control signal source means electrically connected to said first integrated circuit control signal region and capable of providing selected control signals thereto to cause said test circuits first portion resistance means to switch between providing a substantially open circuit and providing a selected resistance value between said first input signal region and said first selected source of voltage;

a test signal source means electrically connected to said first interconnection at a location differing from that at which said first interconnection is connected to said first integrated circuit first input signal region, said test signal source means being capable of providing selected test signals on said first interconnection; and

a test response receipt means electrically connected to said first integrated circuit output signal region to receive said response signals.

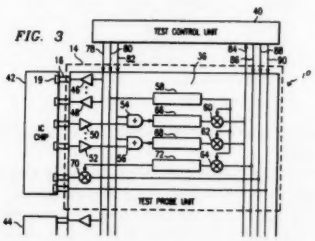
5,070,297

FULL WAFER INTEGRATED CIRCUIT TESTING DEVICE

Oh-Kyong Kwon, Plano; Masashi Hashimoto; Satwinder Malhi, both of Garland, and Eng C. Born, Richardson, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 4, 1990, Ser. No. 532,481
Int. Cl.[5] G01R *31/02*
U.S. Cl. 324—158 P **32 Claims**

FIG. 3



1. An integrated circuit testing device simultaneously connected to a plurality of subject integrated circuits for testing substantially all of said plurality of subject integrated circuits formed on a semiconductor wafer, said testing device connected to and operating in conjunction with a test control unit, said testing device comprising:

a support wafer;

a plurality of probe units formed on said support wafer, each one of said plurality of probe units for testing respective ones of said plurality of subject integrated circuits and comprising a plurality of probe tips operable to communicate with respective nodes associated with a respective subject integrated circuit; and

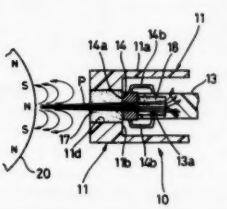
at least one active interface cirucuit formed on said support wafer and connected between said test control unit and said probe units for selectively controlling data transmitted between the test control unit and the subject integrated circuits.

5,070,298

MAGNETIC SENSOR, WITH SENSOR GAP ADJUSTING HIGH PERMEABLE FLUX COLLECTING CHIP, FOR DETECTING ROTATION

Naoko Honda, and Tatsuo Nakajima, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1990, Ser. No. 508,176
Claims priority, application Japan, Apr. 19, 1989, 1-97619
Int. Cl.[5] G01P *3/487, 3/488;* **G01B** *7/30*
U.S. Cl. 324—207.20 **4 Claims**



1. A magnetic sensor for detecting rotation comprising:

(a) a disk-shaped sensing plate which is rotatable with an object to be sensed;

(b) a sensor having a tubular portion and an end wall formed on a front end of said tubular portion, said end wall being disposed in opposed relation to an outer periphery of said sensing plate, a hole being formed through said end wall and having an axis extending in the direction of an axis of said tubular portion;

(c) a magneto-electric transducer mounted in said sensor housing and disposed adjacent to said end wall of said sensor housing, said electro-magnetic transducer comprising a semi-conductor element;

(d) a magnetic flux-collecting chip of a high permeability material capable of being cut, said magnetic flux-collecting chip being received in and fixed to said hole of said end wall of said sensor housing and disposed forwardly of said electro-magnetic transducer, and said magnetic flux-collecting chip having an exposed front face which is directed away from said electro-electric transducer and faces said outer periphery of said sensing plate; and

(e) positioning means for positioning said sensor housing;

wherein said front face of said magnetic flux-collecting chip is so cut that a magnetic gap between said outer periphery of said sensing plate and said front face of said magnetic flux-collecting chip is equal to a predetermined optimum value.

5,070,299

SLICE PROFILE OPTIMIZATION FOR A NUCLEAR MAGNETIC RESONANCE TOMOGRAPHY APPARATUS OPERATED WITH A GRADIENT ECHO SEQUENCE

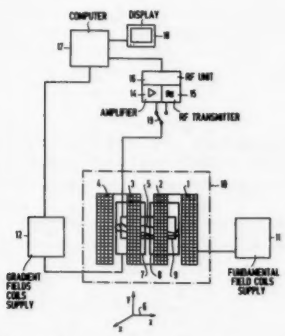
Berthold Kiefer, Erlangen, and Franz Schmitt, Baiersdorf, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jun. 25, 1990, Ser. No. 543,141

Claims priority, application European Pat. Off., Jun. 23, 1989, 89111498.5

Int. Cl.[5] G01R *33/20*

U.S. Cl. 324—309 **5 Claims**



1. In a method for operating a magnetic resonance imaging tomography apparatus using a gradient echo sequence including the steps of exciting nuclear spins in a slice of an examination subject by generating an excitation RF pulse in the presence of a slice selection gradient in a first direction, phase-coding the excited nuclear spins by a phase-coding gradient in a second direction perpendicular to said first direction to obtain a nuclear magnetic resonance signal, and reading out said nuclear magnetic resonance signal in the presence of a read-out gradient in a third direction perpendicular to said first and second directions, the improvement comprising:

generating a pre-saturation RF pulse in said slice selected by said slice selection gradient before generating said excitation RF pulse, said presaturation RF pulse having a frequency spectrum which excites regions of said slice corresponding to the edges of said RF excitation pulse; and

generating a spoiler gradient between said pre-saturation RF pulse and said excitation RF pulse.

5,070,300

APPARATUS FOR MEASURING BREAKDOWN PLASMA

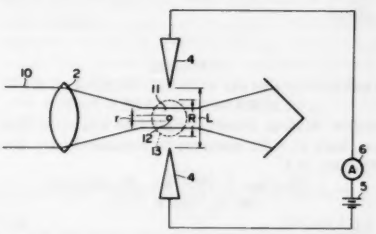
Tetsuya Matsui, Hitachi; Takehiko Kitamori, Ushiku; Kenji Yokose, Hitachi, and Masaharu Sakagami, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 8, 1989, Ser. No. 390,762

Claims priority, application Japan, Aug. 18, 1988, 63-205391

Int. Cl.[5] G01N *27/62*

U.S. Cl. 324—464 **8 Claims**



1. An apparatus for measuring characteristics of breakdown plasma, said apparatus comprising:

irradiating means for irradiating a sample with a focused light beam and for causing breakdown of a particle to be measured in the sample at a focused beam region to change the particle into plasma;

a pair of electrodes arranged on opposite sides of the focused beam region; and

means for measuring an electrical resistance between the electrodes under a condition where the breakdown plasma is produced between the electrodes and for determining a diameter of the particle according to the measured electrical resistance.

5,070,301

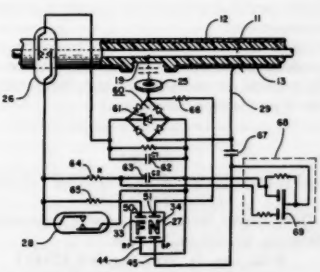
FAULT INDICATOR HAVING LIQUID CRYSTAL STATUS DISPLAY

Edmund O. Schweitzer, Jr., 2433 Center St., Northbrook, Ill. 60062

Continuation of Ser. No. 433,673, Nov. 8, 1989, abandoned. This application Aug. 31, 1990, Ser. No. 577,079

Int. Cl.[5] G01R *31/02;* **G08B** *21/00*

U.S. Cl. 324—509 **34 Claims**



1. A fault indicator for indicating the occurrence of a fault current in a monitored electrical conductor, comprising:

a housing;

status indicating means within said housing comprising a high impedance display device having at least a pair of

display electrodes disposed in operative association with a layer of voltage-responsive light controlling material, the display device providing on the exterior of said housing a first display condition in the absence of an actuating signal applied to said electrodes, and a second display condition in the presence of an actuating signal applied to said electrodes;

a capacitor connected between respective ones of said display electrodes of said display device;

a source of unidirectional current;

switch means responsive to the occurrence of a fault current in the monitored conductor; and

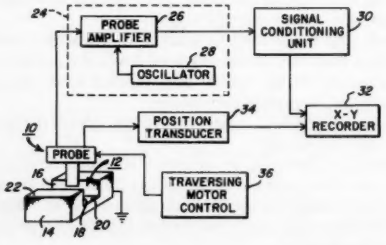
circuit means including said switch means and said current source for applying an actuating signal to said capacitor following occurrence of a fault current in the monitored conductor to condition said display device to said second display condition to indicate the occurrence of said fault current.

5,070,302

CAPACITANCE PROBE FOR MEASURING A WIDTH OF A CLEARANCE BETWEEN PARTS

Michael A. Marcus, Honeoye Falls, and Ernest A. Graff, Ontario, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 5, 1989, Ser. No. 402,285
Int. Cl.[5] G01R *27/26*
U.S. Cl. 324—662 **16 Claims**



1. In a capacitance probe for measuring the width of a slot or other clearance between electrically conductive parts, the probe being of the type including at least one thin, flat probe electrode having front and back sides, a first layer of dielectric material fixedly adhered to said front side, a second layer of dielectric material fixedly adhered to said back side, and a thin, flat guard electrode fixedly adhered to the outer surface of one of said layers of dielectric material, said guard electrode having at least one opening through its thickness opposite said probe electrode to define the active area of the probe, the improvement comprising:

a first layer of high lubricity, electrically insulative material manually peelably adhered to the outer surface of said guard electrode,

the thickness of said manually peelable layer being selectable to produce in the probe a total nominal thickness to optimally position the probe for accurate measurement of the width of said slot or clearance.

5,070,303

LOGARITHMIC AMPLIFIER/DETECTOR DELAY COMPENSATION

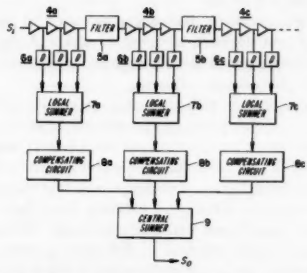
Paul W. Dent, Stehag, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Aug. 21, 1990, Ser. No. 570,607
Int. Cl.[5] G01K *15/10*; G06G *7/12*
U.S. Cl. 328—145 **19 Claims**

1. An apparatus for logarithmically amplifying an input signal comprising:

a plurality of amplifiers connected in series and grouped in at least two amplifier stages said input signal being received in a first amplifier of a first amplifier stage and each amplifier stage generating an output signal;

frequency bandwidth limiting filter means disposed between successive amplifier stages with each filter means delaying signal outputs between successive stages by a time delay period;



compensating means associated with and responsive to at least some of said amplifier stages for compensating output signals from corresponding amplifier stages for a time delay period corresponding to an associated filter means to align said output signals in time; and

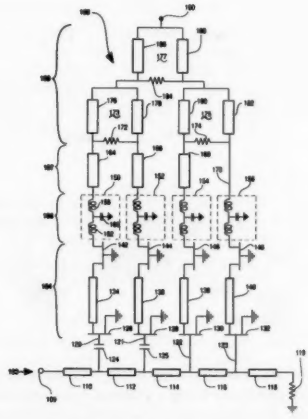
a central summing means for summing the compensated output signals received from said compensating means.

5,070,304

DISTRIBUTED COMBINER POWER AMPLIFIER AND METHOD

Mike L. Salib, Millersville, and Marvin Cohn, Baltimore, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 21, 1990, Ser. No. 543,919
Int. Cl.[5] H03F *3/60*
U.S. Cl. 330—54 **20 Claims**



1. Distributed radio frequency power amplifier apparatus comprising the combination of:

a signal delay line connected to a source of power amplifier input signals, said delay line including an n plurality of delayed signal taps spaced therealong;

an n plurality of signal amplifier circuits each including an output terminal and an input terminal that is connected with one of said delay line delayed signal taps;

an n plurality of impedance matching networks each having an output terminal and an input terminal that is connected with one of said signal amplifier circuit output terminals;

an n−1 plurality of delay equalization delay lines each having an output terminal and an input terminal that is connected to one of said impedance matching network output terminals; and

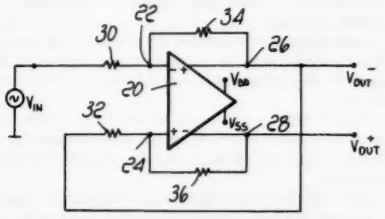
a signal power combining network having an output terminal and an n plurality of input terminals with n−1 of said input terminals being connected with one of said delay equalization delay line output terminals and the nth of said input terminals being connected directly with the unconnected nth impedance matching network output terminal.

5,070,305

DEVICE FOR CONVERTING UNBALANCED ANALOG ELECTRIC SIGNALS INTO FULLY DIFFERENTIAL SIGNALS

Pierangelo Confalonieri, Canonica d'Adda, and Germano Nicollini, Piacenza, both of Italy, assignors to Thomson Microelectronics S. R. L., Agrate Brianza, Italy

Filed Jul. 31, 1990, Ser. No. 560,428
Claims priority, application Italy, Aug. 25, 1989, 21553 A/89
Int. Cl.[5] H03F *3/45*
U.S. Cl. 330—69 **21 Claims**



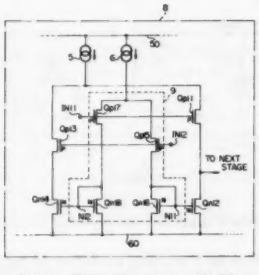
1. Device for converting unbalanced analog electric signals into fully-differential balanced signals, comprising a fully-differential operational amplifier having a first input and a second input and correspondingly a first output and a second output, each of said outputs being fed back to said corresponding input respectively through a first impedance and a second impedance of identical value, said first output being connected to said second input of said operational amplifier through a third impedance, while a fourth impedance, equal in value to said third impedance, being connected in series to said first input.

5,070,306

HIGH-GAIN DIFFERENCIAL AMPLIFIER CIRCUIT FABRICATED FROM FIELD EFFECT TRANSISTORS

Toshiyuki Okamoto, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Mar. 20, 1991, Ser. No. 672,346
Claims priority, application Japan, Mar. 26, 1990, 2-77674
Int. Cl.[5] H03F *3/45*
U.S. Cl. 330—253 **4 Claims**



1. A differential amplifier circuit coupled between first and second power supply lines, comprising:

a) a first constant current source coupled to said first power supply line;

b) a series combination of a first input transistor of a first channel conductivity type and a first load transistor of a second channel conductivity type coupled between said first constant current source and said second power supply line, said first input transistor having a gate electrode serving as a non-inverting input node;

c) a series combination of a second input transistor of said first channel conductivity type and a second load transistor of said second channel conductivity type coupled between said first constant current source and said second power supply line, said second input transistor having a gate electrode serving as an inverting input node; and

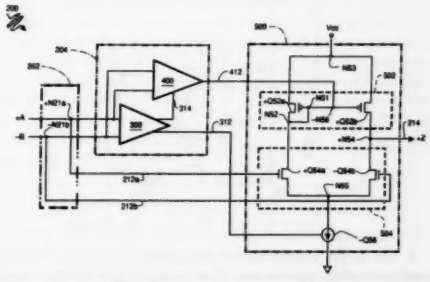
d) a controlling circuit coupled to gate electrodes of said first and second load transistors and operative to increase the channel conductance of one of said first and second load transistors when the associated first or second input transistor decreases current passing therethrough, said controlling circuit being further operative to decrease the channel conductance of the other of said first and second load transistors when the associated first or second input transistor increases current passing therethrough.

5,070,307

DIFFERENTIAL AMPLIFIER WITH ENHANCED SLEW RATE

Paul D. Ta, San Jose, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Dec. 21, 1990, Ser. No. 631,620
Int. Cl.[5] H03F *3/45*
U.S. Cl. 330—253 **8 Claims**



1. A differential amplifier system comprising:

system input means for receiving a first system input signal and a second system input signal;

a final amplifier providing a system output, said final amplifier including

a controlled final current source for providing a final source current having a final source-current magnitude, said final current source having a final current-source control input so that said final source-current magnitude can be varied in response to a final source-current control signal received thereat,

a controlled final mirror-current load for providing a final reference current and a final mirror current sharing a common final load-current magnitude, said final mirror-current load having a load-control input so that said final load-current magnitude can be varied in response to a load-control signal received thereat, and

a final input section for variably coupling said final mirror-current load to said final current source in response to said first and second system input signals, said final input section including a first final control element for controlling access of said final reference current to said final current source in response to said first system input signal, said final input section also including a second final control element for controlling access of said final

mirror current to said final current source in response to said second system input signal, said first final control element having a first final-control-element input coupled to said system input means for receiving said first system input signal therefrom, said second control element having a second final-control-element input coupled to said system input means for receiving said second system input therefrom; and

control means for minimizing the maximum transition time of said system output, said control means being coupled to said system input means for receiving said first and second system inputs therefrom, said control means being coupled to at least one of

said load control input so as to increase said final load-current magnitude to charge an output capacitance when an increase in output voltage is required to reflect a change in the differential between said first system input signal and said second system input signal, and

said final-current-source control input so as to increase said final source-current magnitude to discharge output capacitance when a decrease in output voltage is required to to reflect a change in the differential between said first system input signal and said second system input signal.

5,070,308

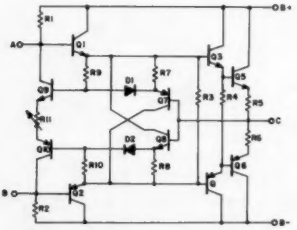
WORKING POINT ADJUSTING CIRCUIT FOR A POWER AMPLIFIER

Gyula Padi, 3808 Nolina Cir., Lancaster, Calif. 93536

Filed Sep. 25, 1990, Ser. No. 588,584

Int. Cl.[5] H03F *3/26*

U.S. Cl. 330—268 **15 Claims**



1. In a single-ended complimentary symmetry pushpull transistor audio power amplifier having a first NPN transistor and a second PNP transistor in an input stage, a third NPN transistor and a fourth PNP transistor, where the base of the first transistor is connected to a first terminal which is an input terminal and the base of the second transistor is connected to a second terminal and where the first transistor and the third transistor, the second transistor and the fourth transistor are respectively Darlington connected, a fifth NPN transistor and a sixth PNP transistor in the output stage, where the third transistor and the fifth transistor, the fourth transistor and the sixth transistor are also respectively Darlington connected and where the collectors of the first transistor, the third transistor and the fifth transistor are connected to a positive power supply and the collectors of the second transistor, the fourth transistor and the sixth transistor are connected to a negative power supply, a first resistor which is connected between the first terminal and the positive power supply, a second resistor which is connected between the second terminal and the negative power supply, a third resistor which is connected between the bases of the third transistor and the fourth transistor, a fourth resistor which is connected between the emitters of the third transistor and the fourth transistor, a fifth resistor and a sixth resistor which are connected between the respective emitters of the fifth transistor and the sixth transistor and a third common terminal which is an output terminal, a working point adjusting circuit comprising:

a. a seventh transistor which is a PNP transistor;

b. the base of said seventh transistor connected to said third terminal;

c. the collector of said seventh transistor connected to the emitter of said second transistor;

d. an eighth transistor which is an NPN transistor;

e. the base of said eighth transistor connected to said third terminal;

f. the collector of said eighth transistor connected to the emitter of s id first transistor;

g. a first diode;

h. the cathode of said first diode connected to the emitter of said seventh transistor;

i. a ninth transistor which is an NPN transistor;

j. the base of said ninth transistor connected to the anode of said first diode;

k. the collector of said ninth transistor connected to said first terminal;

l. a second diode;

m. the anode of said second diode connected to the emitter of said eighth transistor;

n. a tenth transistor which is a PNP transistor;

o. the base said tenth transistor connected to the cathode of said second diode;

p. the collector of said tenth transistor connected to said second terminal;

q. a seventh resistor connected between the emitter of said first transistor and the common connecting point of the cathode of said first diode and the emitter of said seventh transistor;

r. an eighth resistor connected between the emitter of said second transistor and the common connecting point of the anode of said second diode and the emitter of said eighth transistor;

s. a ninth resistor connected between the emitter of said first transistor and the common connecting point of the anode of said first diode and the base of said ninth transistor;

t. a tenth resistor connected between the emitter of said second transistor and the common connecting point of the cathode of said second diode and the base of said tenth transistor; and

u. an eleventh variable resistor **R11** connected between the emitters of said ninth transistor and said tenth transistor.

5,070,309

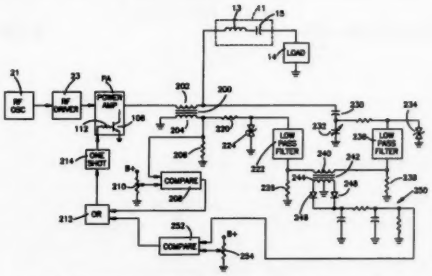
RF POWER AMPLIFIER HAVING IMPROVED AMPLIFIER PROTECTION

Hilmer I. Swanson, Quincy, Ill., assignor to Harris Corporation, Melbourne, Fla.

Filed Jan. 28, 1991, Ser. No. 646,832

Int. Cl.[5] M02H *7/20*

U.S. Cl. 330—298 **7 Claims**



1. An RF power amplifier having amplifier protection, comprising:

an RF source for providing an RF input signal;

an actuatable RF power amplifier having an ON condition and an OFF condition for, when ON, normally receiving

and amplifying said input RF signal to provide an amplified output RF signal;

RF current sensing means coupled to said output circuit for sensing any RF current flowing in said output circuit;

RF voltage sensing means coupled to said output circuit for sensing any RF voltage at said output circuit;

means for receiving said RF current and providing therefrom a first signal of a fixed amplitude, but corresponding in frequency and phase with said RF current;

means for receiving said RF voltage and providing therefrom a second signal of said fixed amplitude, but corresponding in frequency and phase with said RF voltage;

means for receiving said first and second signals and providing therefrom a phase signal having a magnitude dependent upon the phase difference between said first and second signals; and

means for comparing said phase signal with a reference and providing a turn-off signal in dependence upon said comparison for actuating said RF power amplifier to its off condition.

5,070,310

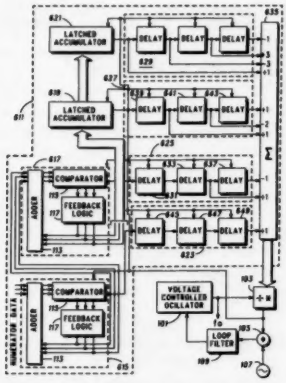
MULTIPLE LATCHED ACCUMULATOR FRACTIONAL N SYNTHESIS

Alexander W. Hietala, Cary, and Duane C. Rabe, Rolling Meadows, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 31, 1990, Ser. No. 576,342

Int. Cl.[5] H03C *3/09*; H03L *7/197*

U.S. Cl. 331—1 A **14 Claims**



1. A fractional-N synthesizer which accepts a digital number of a plurality of bits to select a controllable oscillator output signal frequency and which divides the output signal frequency by a loop divider, the loop divider having a variable divisor controlled by a control input signal to create a feedback signal to be compared to a reference signal, the fractional-N synthesizer comprising:

means for producing a clock signal;

means for integrating the digital number and generating a latched output signal and a first carry output signal on a first occurrence of said clock signal;

means for integrating said latched output signal and generating a second carry output signal on a second occurrence of said clock signal;

means for delaying said first carry output signal until said second occurrence of said clock signal;

means for differentiating said second carry output signal; and

means for combining said delayed first carry output signal and said differentiated second carry output signal to create the control input signal.

5,070,311

INTEGRATED CIRCUIT WITH ADJUSTABLE OSCILLATOR WITH FREQUENCY INDEPENDENT OF THE SUPPLY VOLTAGE

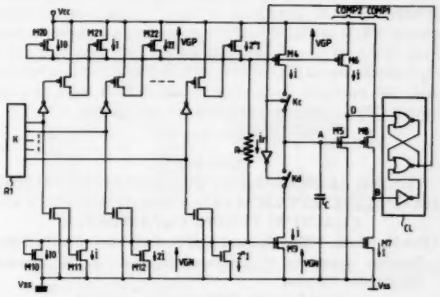
Jean Nicolai, Aix En Provence, France, assignor to SGS-Thomson Microelectronics SA, Gentilly, France

Filed Jul. 3, 1990, Ser. No. 547,878

Claims priority, application France, Jul. 7, 1989, 89 09197

Int. Cl.[5] H03K *3/02*

U.S. Cl. 331—111 **10 Claims**



1. An integrated circuit including a relaxation oscillator that has a capacitor and means for charging and discharging the capacitor, a threshold comparator to trigger the charging of the capacitor when the voltage at the terminals of this capacitor goes below a low threshold Vb and to trigger the discharging of the capacitor when the voltage at the terminals of this capacitor goes above a high threshold Vh, wherein said oscillator further includes a register containing data for adjusting the frequency of the oscillator, said register controlling the selective parallel connection of elementary current sources as a function of its contents, the capacitor-charging and capacitor-discharging currents being linked to the currents of the elementary sources thus connected in parallel, and wherein the comparator sets up high and low thresholds Vh and Vb such that Vh−Vb is proportional to the current for charging and discharging the capacitor.

5,070,312

PULSE WIDTH MODULATION CIRCUIT OF PROGRAMMABLE SUBFRAME SYSTEM

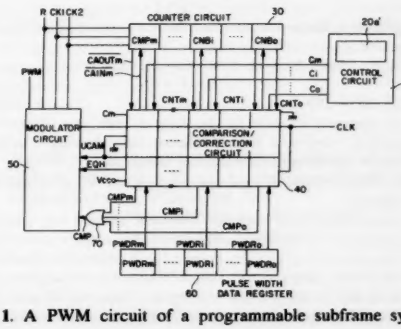
Dong S. Cho, Anyang, Rep. of Korea, assignor to Goldstar Electron Co., Ltd., Cheongju, Rep. of Korea

Filed Aug. 29, 1990, Ser. No. 574,646

Claims priority, application Rep. of Korea, Aug. 31, 1989, 89-12487(U)

Int. Cl.[5] H03K *7/08*

U.S. Cl. 332—109 **2 Claims**



1. A PWM circuit of a programmable subframe system

comprising a control circuit (**20**) for generating control signals (Cm-CO) according to a number of subframes; a PWM data register (**60**) for storing PWM data; a comparison/correction circuit (**40**) that receives said control signals (Cm-CO) from said control circuit (**20**) to determine a sequence of connections of a counter (**30**) and then compare a value of said counter (**30**) with a value of a register (**60**) to generate overflows ((UCAm-UCAO) and (LCAm-LCAO)) under the control of said control signals (Cm-CO) and also simultaneously generate correction signals (CMPm-CMPO), said counter (**3**) for counting-up to return said overflows to said comparison/correction circuit (**40**); an OR Gate (**70**) for OR operating said correction signals (CMPm-CMPO) generated in said comparison/correction circuit (**40**); a modulator (**50**) that receives a highest bit overflow (UCAm) to set a (PWM) output and then receives an equivalence signal (EQm) to reset said output and also receives said OR operated correction signals (CMP) from said OR circuit (**70**) to provide correction for said output.

5,070,313

TUNING ARRANGEMENT FOR COMBINER FILTER HAVING DIELECTRIC WAVEGUIDE RESONATOR AND COACTING TUNING CAPACITANCE

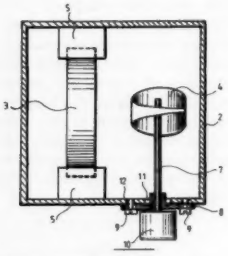
Olov H. Gladh, Vällingby, and Leif S. Kagstrom, Ekerö, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Nov. 29, 1990, Ser. No. 619,442

Claims priority, application Sweden, Dec. 20, 1989, 8904293-1

Int. Cl.[5] H01P *1/20, 7/10;* **H03J** *3/20*

U.S. Cl. 333—202 **4 Claims**



1. A tunable filter comprising:

a dielectric waveguide resonator having a principal axis;

a hollow cylindrical tuning capacitance formed of a substantially isosceles triangle member; and

means for rotating said hollow cylindrical capacitance around an axis substantially parallel to said principal axis of said dielectric waveguide resonator.

5,070,314

HERMETIC MODULE CONTAINING MICROWAVE COMPONENT

Frank Decker, Barto, Pa., assignor to UTI Corporation, Collegeville, Pa.

Filed May 21, 1990, Ser. No. 526,345

Int. Cl.[5] H01P *1/04*

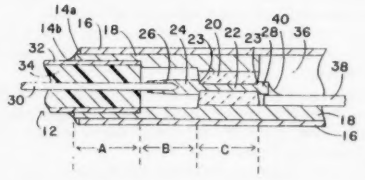
U.S. Cl. 333—260 **6 Claims**

1. A hermetic module for housing at least one electronic component, integrated with a coaxial cable having a center conductor and an outer conductor, comprising:

a housing, defining at least one opening and an interior space therein;

a conductive body member disposed around the interior surface of the housing within the interior space and defining a recess and a cavity therein for containing at least one electronic component, said recess being in registration with the opening in the housing and receiving an end of a coaxial cable inserted into the recess, the interior walls of the recess forming an electrical contact for the outer conductor of the coaxial cable;

a conductor member, having a first end disposed in the recess for mating with the center conductor of the coaxial cable inserted into the recess of the body member and a second end disposed in the cavity;



a sealing member disposed around the conductor member and forming a hermetic seal between the recess and the cavity; and

means for operatively connecting the at least one electronic component in the cavity to the second end of the conductor member.

5,070,315

ELECTROMAGNETIC RELAY

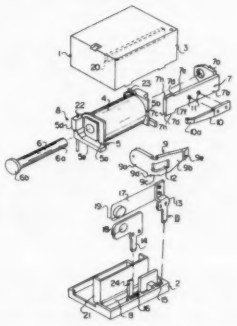
Kiyoaki Kuzukawa, Ibaraki, and Chikayoshi Kawamura, Yamaga, both of Japan, assignors to Omron Corporation, Kyoto, Japan

Filed May 29, 1990, Ser. No. 528,889

Claims priority, application Japan, May 26, 1989, 1-61036[U]; Jun. 8, 1989, 1-66998[U]; Jun. 8, 1989, 1-66999[U]; Oct. 11, 1989, 1-119021[U]

Int. Cl.[5] H01H *50/60*

U.S. Cl. 335—128 **7 Claims**



1. An electromagnetic relay, compromising:

an electromagnetic coil having flanges at longitudinal ends thereof;

an iron core passed centrally through said electromagnetic core;

a yoke having a first end connected to a first end of said iron core;

an L-shaped armature, having a short piece and a long piece connected to each other via a corner portion, pivotally supported by a second end of said yoke at its corner position so that said short piece may move toward a second end of said iron core by magnetic attraction when said electromagnetic coil is energized and move away from said second end of said iron core by a spring force of spring means when said electromagnetic coil is de-energized;

said second end of said yoke comprising a pair of upper edge and lower edge lateral extensions separated by a first

width, and further comprising a free end portion positioned adjacent one of said flanges of said electromagnetic coil comprising a second width larger than said first width; and

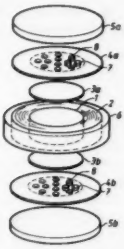
a supporting base comprising groove means for receiving a lateral extension of said yoke second end.

5,070,316

DEVICE FOR TRANSMISSION OF THE MOVEMENT AND FORCE OF A HIGH-MAGNETOSTRICTIVE BODY

Göran Engdahl, Täby, and Dag Wikström, Västerås, both of Sweden, assignors to ABB Atom AB, Västerås, Sweden

Filed Oct. 26, 1990, Ser. No. 604,016
Claims priority, application Sweden, Oct. 31, 1989, 8903632-1
Int. Cl.[5] H01F *7/00, 7/02, 7/06*
U.S. Cl. 335—215 **6 Claims**



1. A device for transmission of movement and compressive force between a cylindrical body of a high-magnetostrictive material and attached force absorbing elements, said body due to magnetostrictive change in the axial length thereof acting as a force-generating element, said force absorbing elements being in the form of discs and making contact with said body, said device comprising circular thin plates which for magnetic reasons consist of a low-loss magnetic material, said thin plates being located between the cylindrical body and the force-absorbing elements, said plates each having a portion which corresponds to a respective end surface of the cylindrical body, a plurality of evenly distributed holes being provided in each said portion, and easily movable pellets of a stiff and resistant material being positioned in said holes.

5,070,317

MINIATURE INDUCTOR FOR INTEGRATED CIRCUITS AND DEVICES

Jayant K. Bhagat, 930 Andover Way, Los Altos, Calif. 94022

Filed Jan. 17, 1989, Ser. No. 298,158
Int. Cl.[5] H09F *5/00;* **H01L** *27/00*
U.S. Cl. 336—200 **6 Claims**

1. An electromagnetic device comprising:

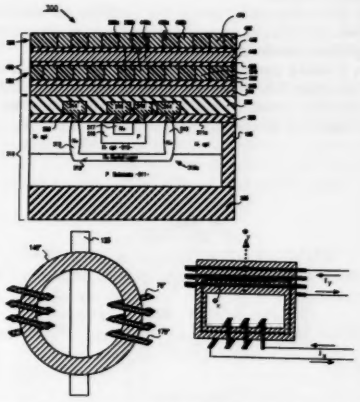
a semiconductor substrate having one or more electrical circuits integrally defined therein;

a magnetic shield layer disposed over the substrate,

a first layer of spaced apart conductive strips disposed over the shield layer;

a magnetic core layer superimposed on the first layer of conductive strips patterned to define first and second transverse magnetic paths;

a second layer of spaced apart conductive strips superimposed on the magnetic core layer; portions of the conductive strips of the second layer are connected to portions of the conductive strips of the first layer to form first and second, substantially helical electrical paths each spiralling about at least one portion of the magnetic core layer for generating or detecting magnetic flux in said one portion of the magnetic core layer, said portion of the magnetic core layer including at least one of said first and second transverse magnetic paths, wherein said magnetic shield layer shields one or more of said electrical circuits



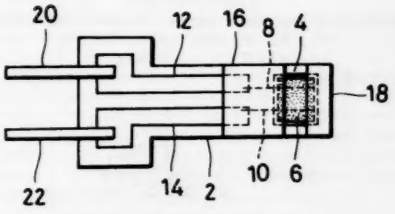
from the flux generated or detected by the first and second helical electrical paths.

5,070,318

EXHAUST GAS SENSOR AND PROCESS FOR PRODUCING SAME

Mariko Hanada, Nara; Kazuo Okino, Hyoogo, and Kazunari Komatsu, Hiroshima, all of Japan, assignors to Figaro Engineering, Inc., Osaka, Japan

Filed Mar. 15, 1989, Ser. No. 323,898
Claims priority, application Japan, Mar. 15, 1988, 63-61222
Int. Cl.[5] H01C *7/00*
U.S. Cl. 338—34 **4 Claims**



1. An exhaust gas sensor including a gas sensitive member comprising a compound $ASnO_3$ wherein A is at least one element selected from the group consisting of Ca, Sr, Ba and Ra, a heat-resistant insulating support member having the gas sensitive member supported thereon, and at least one pair of electrodes connected to the sensitive member, the exhaust gas sensor being characterized in that the compound $ASnO_3$ is free of segregation of the A element and Sn element and greater than 6.8 in acid-base strength as measured with Hammett's indicator in benzene.

5,070,319

DOOR AJAR ALARM FOR REFRIGERATION UNIT

Rodney W. Scuka, Carrollton, Tex., assignor to Ranco Incorporated of Delaware, Wilmington, Del.

Filed Jun. 22, 1990, Ser. No. 542,514
Int. Cl.[5] G08B *21/00, 3/00*
U.S. Cl. 340—384 E **7 Claims**

1. An alarm system for signalling when a door of a refrigerator or freezer compartment is not fully closed comprising:

a. an alarm condition sensing means for detecting whether

the door is in a fully closed position, said sensing means having a first condition when the door is fully closed and a second condition when the door is away from the fully closed position;

b. an alarm signalling means for produce an alarm signal when said sensing means is in said second condition, said signalling means comprising:

i. a housing comprising an integral housing wall section joined to the housing by bridge structure which is flexible for enabling said housing wall section to move relative to the housing;

ii. a vibratable alarm member;

iii. mounting structure for connecting said alarm member to said hosing wall section so that the housing wall section id driven by said member and vibrates relative to the housing when said member vibrates at an operating frequency; and,

iv. alarm member driving circuit means for effecting vibration of said alarm member at said frequency in response to said sensing means being maintained in said second condition for a predetermined time.

5,070,320

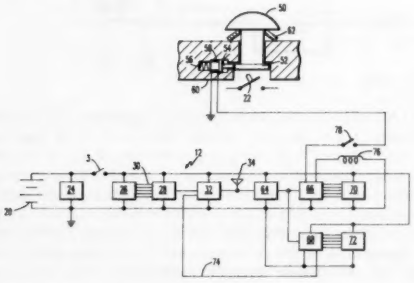
ALARM SYSTEM

Ralph Ramono, 1361 McCartney St., Pittsburgh, Pa. 15220

Filed Jun. 12, 1989, Ser. No. 365,138

Int. Cl.[5] G08B *1/08*; H04Q *7/00*

U.S. Cl. 340—539 **7 Claims**



1. An alarm system comprising:

at least one portable initiator means which is operable to transmit a first coded signal;

said portable initiator means including manually operable actuator means which is operable to actuate said portable initiator means for transmitting said first coded signal;

at least one receiver/retransmitter means operable to be actuated by receiving such a first coded signal and in response to retransmit a second coded signal having a code different from said first coded signal;

receiver means operable to receive said second coded signal;

indicia means associated with said at least one receiver/retransmitter means and operable to provide a local alarm upon actuation of said at least one receiver/retransmitter means and;

said portable initiator means further including locking switch means which is operable to permit locked actuation of said actuator means to thereby limit said transmitting of said first coded signal, said portable initiator means being inoperable until reset by Authorized security personnel.

5,070,321

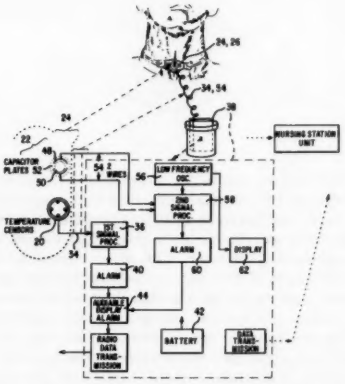
WARNING APPARATUS FOR A TRACHEOTOMY TUBE

Robert K. Einhorn, 138 Amith St., Apt. 1B, and Istvan Szoke, 135 Willow St., Apt. 312, both of Brooklyn, N.Y. 11201, assignors to Robert K. Einhorn; Istvan Szoke and Ansel M. Schwartz

Filed Jun. 18, 1990, Ser. No. 539,694

Int. Cl.[5] G08B *21/00*

U.S. Cl. 340—608 **2 Claims**



2. A warning apparatus for a tracheotomy tube comprising:

an inner cannula with a capacitor disposed therein such that the capacitance of the capacitor corresponds to the percent occlusion of the inner cannula by an obstruction therein, and an alarm means electrically connected to the capacitor to indicate when the inner cannula is obstructed.

5,070,322

AN OVERHEATING DETECTION CIRCUIT INCLUDING A REVERSELY BIASED JUNCTION HAVING A TEMPERATURE DEPENDENT REVERSE LEAKAGE CURRENT FOR DETECTING OVERHEATING OF A POWER INTEGRATED CIRCUIT

Tatsuhiko Fujihira, Kanagawa, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Jul. 17, 1990, Ser. No. 553,340

Claims priority, application Japan, Jul. 19, 1989, 1-186951; Mar. 5, 1990, 2-53086

Int. Cl.[5] G08B *17/06*

U.S. Cl. 340—653 **10 Claims**

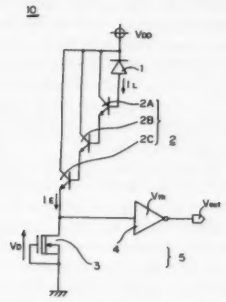
1. An overheating detection circuit for detecting an overheating of a power integrated circuit, said power integrated circuit being formed in a substrate, comprising:

a reversely biased junction having a reverse leakage current, said reverse leakage current being temperature dependent;

means for amplifying said reverse leakage current; and

means for producing a voltage proportional to said amplified

reverse leakage current and for producing a signal when said voltage exceeds a threshold voltage to indicate that



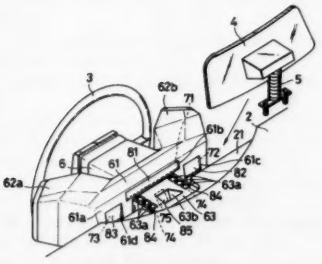
said power integrated circuit is overheated, said overheating detection circuit being disposed in said substrate.

5,070,323

DISPLAY FOR VEHICLE

Tadashi Iino, and Kunimitsu Aoki, both of Susono, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jun. 12, 1989, Ser. No. 364,234
Claims priority, application Japan, Jun. 17, 1988, 63-79539[U]
Int. Cl.[5] G09G *3/00*
U.S. Cl. 340—705 **12 Claims**



1. A display for a vehicle comprising:

an instrument panel disposed between a windshield glass and a driver's seat of a vehicle;

a reflecting member disposed on said instrument panel, said reflecting member having a reflecting surface that faces said driver's seat;

a light-emitting display means, disposed between said windshield glass and said driver's seat of the vehicle, for displaying driving information by emitting light, said display means having a display surface which displays said driving information and which faces said reflecting surface, wherein said driving information is projected onto said reflecting surface from said display surface and reflected from said reflecting surface in the general direction of said driver's seat; and

contrast means for controlling the contrast between light-emitting portions of said display surface and non-light-emitting portions of said display surface such that said contrast is sufficiently high as to be visible from said driver's seat in the presence of exterior light impinging on said display surface, said contrast means comprising a cover plate of a semi-transmissive material that reduces the brightness intensity of exterior light impinging on said display surface, said cover plate positioned between said display surface and said reflecting member such that exterior light directed toward said display surface is transmitted through said cover plate before impinging on said display surface;

wherein the transmissivity of said semi-transmissive material is changeable such that the intensity of the brightness of said exterior light transmitted through said cover plate is controlled, and the entire driving information projected from said display surface is visible from said driver's seat; and

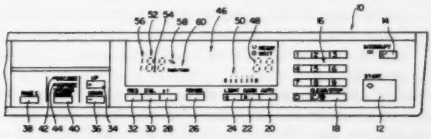
wherein said cover plate is positioned at such an angle with respect to the direction of travel of the exterior light and at such an angle with respect to said reflecting member whereby a substantial portion of the exterior light that is reflected from said cover plate is not projected toward the vicinity of said driver's seat.

5,070,324

VARIABLE MAGNIFICATION COPIER

Tadashi Furushima, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 7, 1989, Ser. No. 404,205
Claims priority, application Japan, Sep. 7, 1988, 63-223763
Int. Cl.[5] G09G *3/02*
U.S. Cl. 340—706 **5 Claims**



1. A copier having a magnification changing function, comprising:

an operation board having at least a dimensional magnification change mode key, a document size input key, a copy size input key, and a magnification change ratio and size data display;

control means for automatically switching data appearing on said magnification change ratio and size data display to size data when a size is to be displayed in a dimensional magnification change mode selected by said dimensional magnification change mode key; and

selecting means for selecting one of a plurality of units;

wherein said control means controls said selecting means to automatically display size data, without a decimal point, when a unit selected by said selecting means has only integer values of size data.

5,070,325

COORDINATE INPUT APPARATUS

Atsushi Tanaka, Kawasaki; Kiyoshi Kaneko, Yokohama; Yuichiro Yoshimura, Yokohama; Noriyuki Suzuki, Tokyo; Katsuyuki Kobayashi, Tokyo; Shigeki Mori, Tokyo, and Shinnosuke Taniishi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1989, Ser. No. 324,109
Claims priority, application Japan, Mar. 18, 1988, 63-63180; Mar. 18, 1988, 63-63181
Int. Cl.[5] G06K *11/06*; G06F *3/033*
U.S. Cl. 340—706 **17 Claims**

1. A coordinate input apparatus comprising:

a vibration pen including vibration generating means for generating a vibration;

a vibration transmission plate for transmitting the vibration generated by said vibration pen;

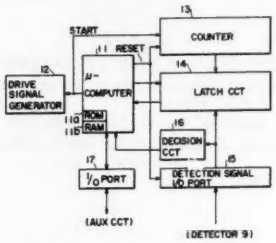
a plurality of vibration detecting means for detecting the vibration transmitted by said vibration transmission plate;

calculating means for calculating vibration transmission times from a point designated by said vibration pen to said

plurality of vibration detecting means, and calculating coordinate values of the designated point designated by said vibration pen;

memory means for storing the vibration transmission times from a first designated point of said vibration pen on said vibration transmission plate to said plurality of vibration detecting means and coordinate values of the first designated point; and

control means for performing calculations on the basis of vibration transmission times from a second designated point calculated by said calculating means to said plurality of vibration detecting means, the vibration transmission



times from the first designated point and the coordinates values of the first designated point stored in said memory means, thereby calculating coordinate values of the second designated point,

wherein said control means subtracts the vibration transmission times stored in said memory means from the vibration transmission times from the second designated point to said pluraltiy of vibration detecting means to calculate a vibration transmission time difference betwcen the first and second designated points, and calculates the coordinate values of the second designated point on the basis of the vibration transmission time difference and the coordinate values of the first designated point.

5,070,326

LIQUID CRYSTAL DISPLAY DEVICE

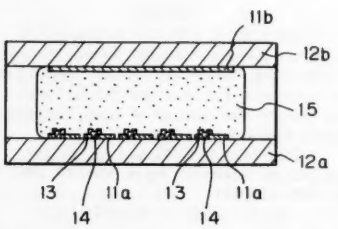
Hataaki Yoshimoto, Chiba, and Katsuhiro Ito, Ichihara, both of Japan, assignors to Ube Industries Ltd., Ube, Japan

Filed Apr. 7, 1989, Ser. No. 334,640

Claims priority, application Japan, Apr. 13, 1988, 63-89224; Jun. 6, 1988, 63-138870; Jun. 8, 1988, 63-139438

Int. Cl.[5] G09G *3/36*

U.S. Cl. 340—719 **20 Claims**



1. A multiplex drive, liquid crystal display device comprising

a first transparent base

a plurality of picture element electrodes arranged on the first base;

a plurality of signal lines arranged on the first base adjacent the plurality of picture element electrodes and supplying electric signals to each one of the plurality of picture element electrodes;

a second transparent base disposed parallel to and separated from the first base by a predetermined spacing;

a plurality of scanning electrodes arranged on a surface of the second base such that said plurality of scanning electrodes opposes the picture element electrodes across the predetermined spacing between the first and second bases;

a liquid crystal material principally of the nematic curvilinear aligned phase type disposed between the plurality of picture element electrodes and the plurality of scanning electrodes and being dispersed in a matrix consisting essentially of a polymeric material;

a plurality of varistors connecting the plurality of picture element electrodes to the adjacent plurality of signal lines, each one of said plurality of varistors formed as a layer comprising fine particles having a size of from 0.1 to 30 μm, said particles consisting essentially of ZnO particles doped with at least one member selected from the group consisting of Bi_2O_3, CO_2O_3, $MnO_2$and b_2O_3; and

a plurality of red, green and blue color filters disposed between the second base and the plurality of scanning electrodes in locations corresponding to the plurality of picture element electrodes.

5,070,327

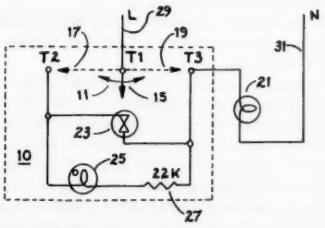
SIGNALLING MECHANISM

Dale Ellingson, 3191 N. Star Rd., Cottage Grove, Wis. 53527

Filed Sep. 11, 1989, Ser. No. 405,422

Int. Cl.[5] G08B *5/00*

U.S. Cl. 340—815.14 **7 Claims**



1. A mechanism having an electrical circuit using only AC power and providing an intermittent visual emergency signal and including:

a switch handle movable to a first, second or third position;

a circuit interrupting device slidably removable from the front of such mechanism and activated when such handle is in the second position;

a device for visually indicating when such handle is in the second position;

such mechanism being configurated and arranged such that all portions of such electrical circuit may be received in a standard residential switch outlet box.

5,070,328

METHOD OF CHECKING THE LOADING AND UNLOADING OF TANKERS BY MEANS OF AN ELECTROMAGNETIC IDENTIFICATION SYSTEM, AND AN IDENTIFICATION SYSTEM FOR USE IN SAID METHOD

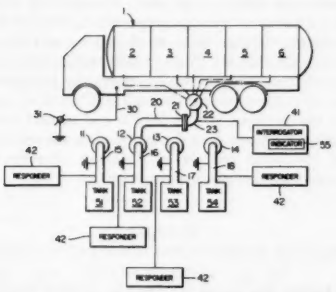
Tallienco W. H. Fockens, Eibergen, Netherlands, assignor to N.V. Nederlandsche Apparatenfabriek, De Groenlo, Netherlands

Continuation-in-part of Ser. No. 462,318, Dec. 26, 1989, abandoned, which is a continuation of Ser. No. 87,801, Aug. 21, 1987, abandoned. This application Dec. 5, 1990, Ser. No. 622,189

Claims priority, application Netherlands, Aug. 25, 1986, 8602148

Int. Cl.[5] H04Q *1/00*

U.S. Cl. 340—825.54 **5 Claims**



1. A system for checking the loading and unloading of tankers, comprising:

a plurality of compartments adapted to be loaded and unloaded with fluent material;

first grounding means to ground said plurality of compartments;

a valve system for selecting one of said plurality of compartments and displaying the selected compartment;

hose means having an electrical conductor;

first connecting means for electrically connecting said valve system to one end of said hose means;

a plurality of storage tanks adapted to be loaded and unloaded;

a plurality of pipes each connected to a respective one of said plurality of storage tanks;

second grounding means to ground each of said plurality of pipes;

a plurality of second connecting means each connected to a respective one of said plurality of pipes, a closed loop electrical circuit being created from ground through said plurality of compartments, first connecting means, hose means, one of said plurality of second connecting means, a respective one of said plurality of pipes and back to ground upon connection of one of said plurality of second connecting means to said hose means;

interrogator means, inductively coupled to said first connecting means, for generating an interrogation field and having indicator means for indicating to a user which storage tank is connected; and

a plurality of responders each inductively coupled to a respective one of said plurality of pipes, each having detection means for detecting the presence of said interrogation field and means responsive to detecting the presence of said interrogation field to send an identification signal through said closed loop electrical circuit, wherein said interrogator means receives said identification signal from a respective one of said plurality of responders inductively coupled to said electrical circuit and said indicating means produces an indicating signal identifying the one of said plurality of pipes connected to said electrical circuit.

5,070,329

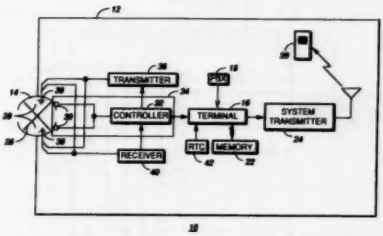
ON-SITE COMMUNICATION SYSTEM WITH RF SHIELDING HAVING PAGER IDENTIFICATION CAPABILITY

Leon Jasinaki, Ft. Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 4, 1989, Ser. No. 445,259

Int. Cl.[5] H04B *7/00*

U.S. Cl. 340—825.44 **19 Claims**



1. In an on-site communication system including an on-site transmitter for transmitting, on a predetermined frequency within a predetermined coverage area, messages to a plurality of portable communication receivers, the portable communication receivers including acknowledge back response capability, a system for the identification of the portable communication receivers comprises:

entry means, for allowing access into the predetermined coverage area, said entry means including RF shielding means for shielding the portable communication receivers located therein from the message transmissions by the on-site transmitter;

detector means, coupled to said entry means for detecting the presence of the portable communication receivers within said entry means;

identification transmitter means, coupled to said detector means, for transmitting within said RF shielding means a query signal on the predetermined frequency in response to one of the plurality of portable communication receivers being detected within said entry means; and

identification receiver means, coupled to said entry means, for receiving an acknowledge back signal transmitted by the portable communication receiver located within said RF shielding means in response to the query signal being transmitted, the received acknowledge back signal providing identification of the portable communication receiver entering said entry means.

5,070,330

KEYBOARD SCANNING MATRIX

Dennis Wu, Kao-Hsiung Hsien, Taiwan, assignor to Acer Incorporated, Japan

Continuation-in-part of Ser. No. 296,485, Jan. 12, 1989, abandoned. This application Oct. 5, 1989, Ser. No. 417,526

Int. Cl.[5] H03M *11/00*

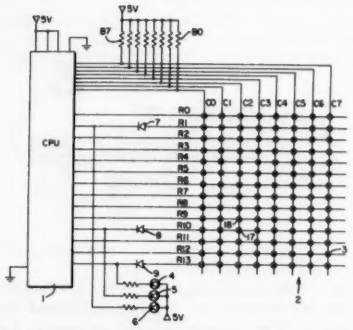
U.S. Cl. 341—26 **3 Claims**

1. A keyboard comprising:

a matrix of rows and columns of conductor lines which can be electrically interconnected by a corresponding key at each intersection of a row and a column;

a scanning device having scan terminals coupled to the row conductor lines and sense terminals coupled to the column conductor lines, said scanning device being adapted to apply, during a scanning operation, a first potential of one polarity, from said terminals to all conductor lines, to subsequently, sequentially apply a second potential of the opposite polarity to the row conductor lines through said scan terminals, and to monitor the potential of column conductor lines through said sense terminals in order to determine whether a key is being depressed; and

an indicating device connected to at least one of said scan terminals, said indicating device being responsive to the potential applied thereto for being placed in one operative state responsive to the application of the first potential from said scan terminal and in a second operative state responsive to said second potential from said scan terminal; and



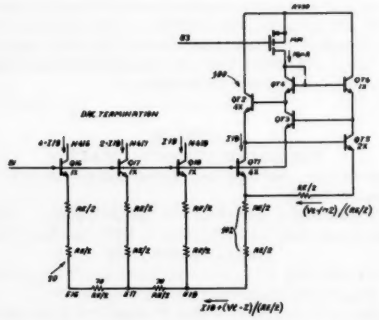
a diode interposed in the row conductor line coupled to said at least one scan terminal between the connection of said indicating device to said scan terminal and said matrix, said diode being poled to prevent the application of said second potential from said matrix to said indicating device for preventing alteration of the operative condition of said indicating device by a second potential so applied.

5,070,331

HIGH RESOLUTION D/A CONVERTER OPERABLE WITH SINGLE SUPPLY VOLTAGE

Shinichi Hisano, Boston, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.

Filed Mar. 15, 1990, Ser. No. 493,920
Int. Cl.[5] H03M *1/78*
U.S. Cl. 341—154 **5 Claims**



1. In a high-resolution digital-to-analog converter adapted to be powered by a single supply voltage, said converter including a plurality of NPN transistors serving as current sources and having equal emitter areas, means connecting the bases of said transistors together, an R-2R ladder network having series resistors of R and shunt resistors of 2R, with the shunt resistors thereof connected to respective current-source emitters to provide for binary weighting of the transistor currents, a 2R termination resistor connected to the nodal junction of the last shunt and series resistors at the least-significant bit end of said ladder, and circuit means for minimizing errors due to temperature-responsive changes in the offset voltages of said current-source transistors;

that improvement wherein said circuit means comprises means for developing through said termination resistor a current having two components, said means including:

a first additional NPN transistor having its base connected to the bases of said current-source transistors, and its emitter connected to the end of said 2R termination resistor which is remote from said nodal junction;

means for developing through said additional NPN transistor a first current component which flows through said termination resistor, said first current component having a magnitude equal to that of the current which flows through the least significant bit current-source transistor and through said last shunt resistor connected thereto; and

second additional NPN transistor means coupled between said single supply voltage and said remote end of said 2R termination resistor to produce through said termination resistor a second current component equal to $(VT \cdot \ln 2)/R$;

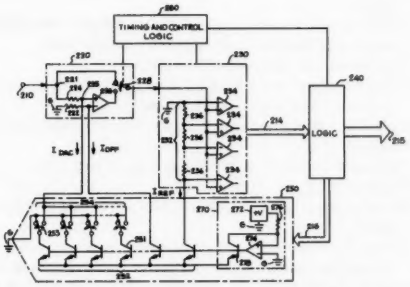
whereby the voltage drop developed by said first current component flowing through said termination resistor is equal to the voltage drop developed by said least significant bit current flowing through said last shunt resistor, so that the potential at said remote end of said termination resistor is greater than the potential at the emitter end of said last shunt resistor by $2VT \cdot \ln 2$, thereby to effect proper temperature compensation.

5,070,332

TWO-STEP SUBRANGING ANALOG TO DIGITAL CONVERTER

Roy S. Kaller, and David M. Thomas, both of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

Filed Mar. 18, 1991, Ser. No. 671,219
Int. Cl.[5] H03M *1/14*
U.S. Cl. 341—156 **19 Claims**



1. A subranging high-resolution analog-to-digital converter, comprising:

(a) a low-resolution flash analog-to-digital converter for subjecting first an analog input signal and second an analog error signal to conversion into corresponding first and second low-resolution digital signals, said low-resolution analog-to-digital converter comprising a reference voltage ladder consisting of a string of series resistors;

(b) a current-output reference digital-to-analog converter of resolution equal to that of said low-resolution analog-to-digital converter for reconverting said first low-resolution digital signal into a corresponding analog feedback signal;

(c) error measurement means for measuring the difference between said analog feedback signal and said analog input signal to determine said analog error signal;

(d) logic means for combining said first and second low-resolution digital signals into a high-resolution digital signal; and

(e) timing and control means for sequentially enabling production of said first low-resolution digital signal, said analog feedback signal, said analog error signal, said sec-

ond low-resolution digital signal, and said high-resolution digital signal;

wherein a single string of current sources controlled by the same servo circuit is used to generate at least two reference currents.

5,070,333

FREQUENCY-TO-DIGITAL CONVERTER USING A COMBINED COUNTED AND TIME METHOD

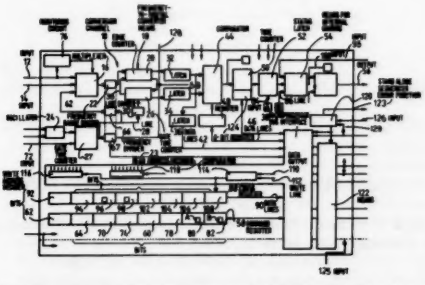
Klaus W. Marschall, Dornerweg 1, 7758 Meersburg, Fed. Rep. of Germany

Filed Feb. 7, 1990, Ser. No. 477,252

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1989, 3931980

Int. Cl.[5] H03M *1/60*

U.S. Cl. 341—157 13 Claims



1. Frequency-to-digital converter, being characterized as an integrated device neither containing nor forming part of a microprocessor, and comprising:

(a) a processor bus interface (38) having data, address and control lines,

(b) at least one converter channel (10) having

at least one clock (24),

at least one input (12,14),

means (18) for frequency-to-digital conversion,

a comparator (44) for comparing a digital frequency equivalent with a programmed digital word and which is arranged to signal exceeding of a limit value at an output (56) of the device through

a programmable time-counter (50),

a status memory (52) and

means (54) for an internal gating of external states,

a command register (58) which is arranged to determine and initiate a conversion mode,

a range register (22,66,67) which is arranged to determine a conversion range, a test frequency and a output frequency, and

a status register (88) which is arranged to offer information about a present state of the converter channel (10) to the processor, and

(c) a stand-alone sequencer (120) having an error function indicator and controlled by discrete input lines, for processor-independent configuration of the device from an external memory.

5,070,334

METHOD AND DEVICE FOR ASSISTING TERRESTRIAL VEHICLE TRAFFIC

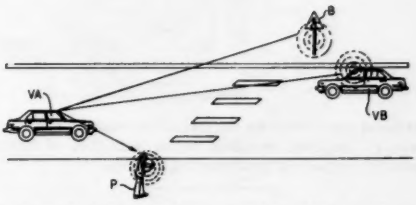
Henri Commissaire, Elancourt; Pierre Pathier, Biervres, and Jacques Sirven, Versailles, all of France, assignors to Electronique Serge Dassault, Saint-Cloud, France

Filed Mar. 8, 1990, Ser. No. 490,308

Claims priority, application France, Mar. 21, 1989, 89 03700

Int. Cl.[5] G01S *13/80*

U.S. Cl. 342—43 31 Claims



1. A method for assisting terrestrial vehicle traffic, the method including the steps of:

a) providing, at each of a plurality of terrestrial vehicles, a respective first radar signal,

transmitting for selected time periods a corresponding respective first radar wave lying in a first predetermined frequency band, wherein said first radar wave adapted for distance measurement over a range of several hundred meters,

b) transponding, at each of said plurality of terrestrial vehicles, any first radar wave received within said first predetermined frequency band, through a predetermined frequency shift, into a second radar wave lying within a second predetermined frequency band,

c) receiving, at each of said plurality of terrestrial vehicles, any such incoming second radar wave,

comparing the same to the local first radar signal in order to measure therefrom the distance between the local vehicle and the vehicle having transponded the signal, and

whereby a plurality of vehicles can make said distance measurements with regard to nearby other vehicles with reduced risk of interference by using the same first radar wave frequency in the same area;

step a) further comprises the steps of: modulating said first radar signal by phase reversal according to a pseudo-random code selectively associated with the vehicle, and

step c) further comprises the step of: correlating the incoming second radar wave with said pseudo-random code in order to measure therefrom the distance between the local vehicle and the vehicle having transponded the signal.

5,070,335

PULSE DOPPLER RADAR SYSTEMS FOR HELICOPTER RECOGNITION

Christopher Lewis, and Robert J. Barton, both of Isle of Wight, England, assignors to Siemens Plessey Electronic Systems Limited, Ilford, England

Filed Nov. 8, 1990, Ser. No. 610,210

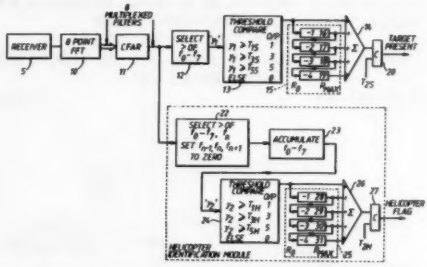
Claims priority, application United Kingdom, Dec. 21, 1989, 8928829; Apr. 23, 1990, 9009051

Int. Cl.[5] G01S *13/50, 13/88*

U.S. Cl. 342—90 8 Claims

1. A pulse doppler radar system for helicopter recognition, comprising a receiver for receiving reflected pulse radar signals, means for distinguishing a group of received frequencies within a predetermined spectral range and for ignoring at least the largest amplitude frequency within that group, threshold detection means for determining when the amplitude of the remaining frequencies in the group exceed a predetermined value and for providing a recognition signal and an accumula-

tor for combining the signals of said remaining signals to provide an aggregate amplitude for evaluation by the threshold



detection means wherein the threshold detection means has a series of weighted threshold values indicative of different levels of certainty of helicopter recognition.

5,070,336

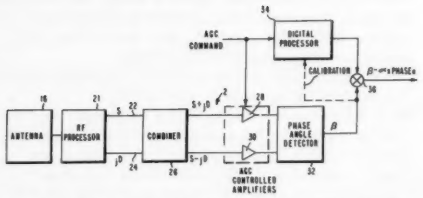
RADAR GUIDANCE SYSTEM CORRECTING HARDWARE INDUCED CHANNEL-TO-CHANNEL PHASE ERRORS

Richard C. Pringle, Van Nuys, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 11, 1991, Ser. No. 653,527

Int. Cl.[5] G01S *13/44*

U.S. Cl. 342—151 **4 Claims**



1. A method of correcting for AGC amplifier contributed errors in the receiver of a phase dependent radar system having a first channel where the sum S of signals received are provided and a second channel where the difference D of signals received are provided, comprising:

applying a test signal of known characteristics to the receiver with the second channel set to D =0;

measuring phase values rendered by the receiver when the AGC amplifier attenuation is modified over a plurality of different values; and

algebraically adding selected test phase values to measured target phase values, said selected test phase values corresponding to actual AGC amplifier attenuation existing during said measuring of target phase values.

5,070,337

OPTIMIZATION METHOD AND AN OPTIMIZED FILTER FOR SIDELOBE SUPPRESSION

Xiao H. Chen, Rakentajantie 5 F 204, 90570 Oulu, and Juhani Oksman, Lyijytie 6B, 90250 Oulu, both of Finland

Filed Apr. 5, 1991, Ser. No. 681,329

Int. Cl.[5] G01S *7/28*

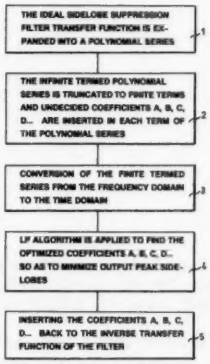
U.S. Cl. 342—201 **12 Claims**

1. An optimization method for sidelobe suppression for a pulse compression radar system utilizing a binary coding waveform, said method comprising

using a polynomial series with unknown coefficients A, B, C, D, . . . to approximate an ideal sidelobe suppression filter transfer function H(f) in a frequency domain,

converting the polynomial series from the frequency domain to a time domain by an inverse Fourier transform,

optimizing the coefficients A, B, C, D . . . so as to minimize output peak sidelobes, and


THE IDEAL SIDELOBE SUPPRESSION FILTER TRANSFER FUNCTION IS EXPANDED INTO A POLYNOMIAL SERIES
THE INFINITE TERMED POLYNOMIAL SERIES IS TRUNCATED TO FINITE TERMS AND UNDECIDED COEFFICIENTS A, B, C, D... ARE INSERTED IN EACH TERM OF THE POLYNOMIAL SERIES
CONVERSION OF THE FINITE TERMED SERIES FROM THE FREQUENCY DOMAIN TO THE TIME DOMAIN
LP ALGORITHM IS APPLIED TO FIND THE OPTIMIZED COEFFICIENTS A, B, C, D... SO AS TO MINIMIZE OUTPUT PEAK SIDELOBES
INSERTING THE COEFFICIENTS A, B, C, D... BACK TO THE INVERSE TRANSFER FUNCTION OF THE FILTER

inserting the optimized coefficients A, B, C, D into the transfer function H(f) of the sidelobe suppression filter.

5,070,338

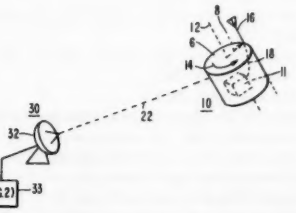
DOPPLER DETERMINATION OF SATELLITE ATTITUDE

Clark E. Cohen, Stanford, Calif., assignor to General Electric Company, East Windsor, N.J.

Filed Aug. 24, 1989, Ser. No. 397,939

Int. Cl.[5] H04B *7/185;* **G06F** *15/48;* **B64G** *1/24*

U.S. Cl. 342—355 **12 Claims**



1. A method for determining the attitude of a spin-stabilized spacecraft orbiting a heavenly body, which spacecraft includes a spinning portion bearing an antenna offset from the spin axis, comprising the steps of:

transmitting a signal with a predetermined frequency characteristic, along plural different lines-of-sight between said antenna on said spacecraft and a single tracking station;

at the receiving end of said lines-of-sight, monitoring the magnitude of the Doppler frequency shift of said predetermined frequency characteristic, which shift is attributable to motion of said antenna about said spin axis;

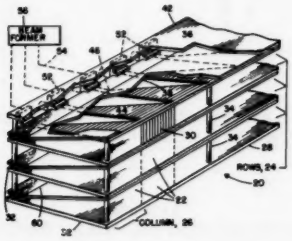
calculating, from said Doppler frequency shifts over said plurality of lines-of-sight, the attitude of said spacecraft.

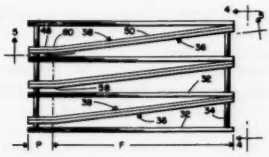
5,070,339

TAPERED-ELEMENT ARRAY ANTENNA WITH PLURAL OCTAVE BANDWIDTH

Ruey S. Chu, Cerritos; Nam S. Wong, Fullerton, and Ernie T. Ozaki, San Diego, all of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Dec. 21, 1989, Ser. No. 456,018
Int. Cl.[5] H01Q *1/38*
U.S. Cl. 343—700 MS **21 Claims**





1. A microstrip radiator comprising:

an input end and an output end, and a ground-plane element extending from said input end to said output end;

a microstrip conductor element extending lengthwise across said radiator from said input end to said output end and having an input section at said input end of said radiator and an output section at said output end of said radiator;

a dielectric layer disposed contiguous said microstrip conductor element on a side of said microstrip conductor element opposite said ground-plane element to form an inverted microstrip with an air dielectric between said microstrip conductor element and said ground-plane element; and

wherein said conductor element is spaced apart from said ground plane element;

said input section of said conductor element is of uniform width and is disposed at a predetermined spacing parallel to said ground-plane element;

said output section of said conductor element varies in width from a minimum width contiguous said input section to a larger width distant from said input section; and

at least a part of said output section of said conductor element is oriented at a varying spacing relative to said ground-plane element to extend from said predetermined spacing to a larger spacing, said varying spacing increasing with increasing distance from said input end of said radiator.

5,070,340

BROADBAND MICROSTRIP-FED ANTENNA

Leopoldo J. Diaz, Golden, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Jul. 6, 1989, Ser. No. 376,299
Int. Cl.[5] H01Q *13/08*
U.S. Cl. 343—767 **13 Claims**

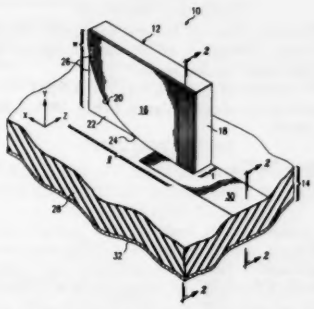
1. A broadband antenna, comprising:

a first substrate;

microstrip feed element being disposed along a first surface of said first substrate;

notch antenna means comprising a second substrate and a metalization portion thereupon, said notch antenna means being positioned orthogonal to said first surface of said first substrate with said metalization portion in direct physical and electrical contact with said microstrip feed element for direct signal transmission therebetween; and

ground means being disposed along a second surface of said



first substrate in a substantially opposing relationship to said microstrip feed element and being positioned to provide a ground for said notch antenna means,

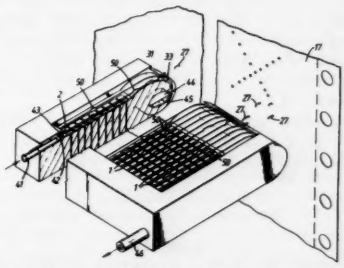
wherein said broadband antenna generates an E-field in a plane orthogonal to said first substrate and propagating from the end of said notch antenna means.

5,070,341

LIQUID STREAM DEFLECTION PRINTING METHOD AND APPARATUS

Leslie J. Wills, Lidcombe, and David E. Turvey, Beecroft, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organisation, Australia

PCT No. PCT/AU87/00294, § 371 Date Mar. 24, 1989, § 102(e) Date Mar. 24, 1989, PCT Pub. No. WO88/01572, PCT Pub. Date Mar. 10, 1988
PCT Filed Aug. 28, 1987, Ser. No. 343,330
Int. Cl.[5] G01D *15/18*
U.S. Cl. 346—1.1 **20 Claims**



1. A method for producing a supply of liquid slugs of a predetermined length, said method comprising the steps of

(a) establishing a continuous stream of liquid from an orifice, said liquid stream having no perturbation applied thereto at or near said orifice, and having a natural break-off point at which the continuous stream breaks up into droplets;

(b) causing the continuous stream of liquid to pass over an array of electrodes positioned between said orifice and said break-off point, said array of electrodes extending in the same direction as said stream of liquid;

(c) applying a voltage signal sequentially to the electrodes of the array at a rate which is substantially equal to the velocity of the liquid of the stream past the electrodes, to deflect a portion of the liquid stream away from the undeflected path of the stream; and

(d) interrupting and collecting either the deflected portion or the undeflected portion of the liquid stream.

5,070,342

THERMAL PRINTER

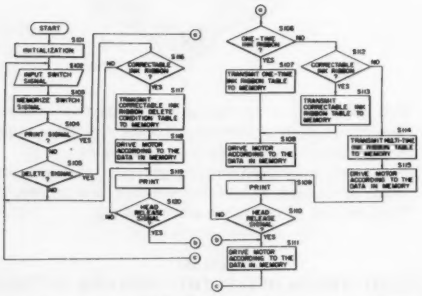
Takashi Okumura, Nagoya; Koshiro Yamaguchi, Inuyama, and Michio Ueda, Gamagoori, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Feb. 5, 1990, Ser. No. 475,017

Claims priority, application Japan, Feb. 7, 1989, 1-28050; Feb. 7, 1989, 1-28051

Int. Cl.[5] B41J *2/325*

U.S. Cl. 346—76 PH **18 Claims**


START
INITIALIZATION
INPUT SWITCH SIGNAL
MEMORIZE SWITCH SIGNAL
PRINT SIGNAL
DELETE SIGNAL
CORRECTABLE INK RIBBON ?
TRANSMIT CORRECTABLE INK RIBBON DELETE CONDITION TABLE TO MEMORY
DRIVE MOTOR ACCORDING TO THE DATA IN MEMORY
PRINT
HEAD RELEASE SIGNAL
ONE-TIME INK RIBBON ?
TRANSMIT ONE-TIME INK RIBBON TABLE TO MEMORY
TRANSMIT CORRECTABLE INK RIBBON TABLE TO MEMORY
TRANSMIT MULTI-TIME INK RIBBON TABLE TO MEMORY

1. A thermal printer comprising an ink ribbon, a platen, a thermal head confronting said platen, and a carriage reciprocally movable along said platen supporting said thermal head, ink on said ink ribbon being transferred, in accordance with an image to be printed, by means of said thermal head onto a recording medium loaded on said platen, said printer comprises:

memory means having stored therein predetermined printing condition data corresponding to a plurality of print modes, said plurality of print modes including a mode in which only printing can be executed and a mode in which printing and erasing can both be executed, said printing condition data being determined depending upon characteristics of a plurality of types of said ink ribbon;

select means for selecting one of said plurality of print modes; and

setting means for setting printing conditions based on the data stored in said memory means in accordance with the print mode selected by said select means.

5,070,343

PRINTING HEAD FOR RESISTIVE RIBBON TYPE PRINTING APPARATUS

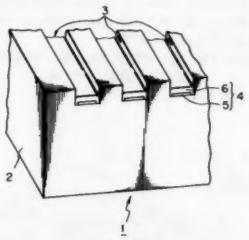
Ribun Nakazawa, Tokyo, Japan, assignor to Teikoku Piston Ring Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 399,612, Aug. 28, 1989, abandoned. This application Apr. 30, 1991, Ser. No. 693,058

Int. Cl.[5] G01D *15/10;* **B05D** *5/12;* **H01C** *17/06*

U.S. Cl. 346—76 PH **5 Claims**

1. A printing head for a resistive ribbon type printing apparatus, which printing head comprises an insulating ceramic substrate and a plurality of printing electrodes, characterized in that said ceramic substrate is made of a machinable ceramic and is provided with a plurality of U-shaped grooves, and each of said printing electrodes is made of an electroless-plated thin layer formed on a bottom surface of each of said grooves, and an electroplated layer formed on said thin layer within each of said grooves, whereby said printing electrode has a thickness smaller than a depth of said grooves, wherein said electroplated layer is one selected from the group consisting of a hard Cr plating layer and an alloy plating layer.



5,070,344

WRITING INSTRUMENT IDENTIFICATION PROCESS AND DEVICE

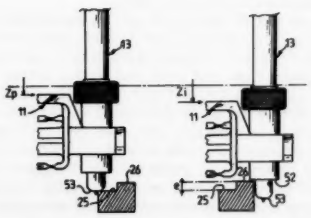
Yves J. Gascuel, Verrieres le Buisson, and Jean-Pierre Cointre, Le Plessis Trevise, both of France, assignors to Océ Graphics France S.A., Cedex, France

Filed Jun. 22, 1989, Ser. No. 369,968

Claims priority, application France, Jun. 30, 1988, 88 08803

Int. Cl.[5] G01D *15/16*

U.S. Cl. 346—1.1 **16 Claims**



1. Identification process for a writing instrument in a graphics apparatus comprised of a plotter head displaceable in at least a first direction parallel to a print medium to trace predetermined graphic patterns on the print medium, the writing instrument, supported by the plotter head, being furthermore displaceable along a second direction substantially perpendicular to the first so as to move away from or towards the print medium, wherein:

one of the first and second directions being selected as the detection direction, the writing instrument bears an identification surface located at a location along the detection direction that is a function of the type of writing instrument, the graphics apparatus comprises detecting means to detect the position of the writing instruments in the writing direction and which process includes the following steps:

bringing the writing instrument up to an identification position at which position the identification surface is in contact with an identification abutment of the graphics apparatus; and

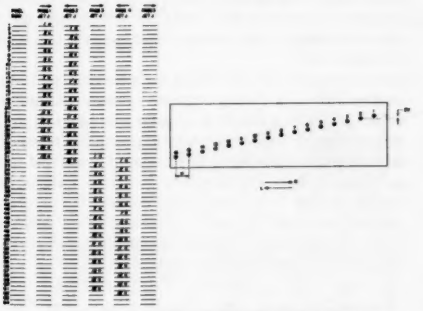
detecting the identification position of the writing instrument along the detection direction when the identification surface is in contact with the identification abutment of the graphics apparatus in order to deduce therefrom the location of the identification surface along the detection direction and thereby an indication of the type of instrument supported by the head.

5,070,345

INTERLACED INK JET PRINTING

Joseph Lahut, and Jim Keeler, both of Thousand Oaks, Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Filed Feb. 2, 1990, Ser. No. 474,555
Int. Cl.[5] B41J *2/01, 2/15*
U.S. Cl. 346—1.1 **28 Claims**



1. For use in an ink jet printer having a print head comprised of a plurality of jetting nozzles for jetting heated ink droplets onto a substrate comprised of a plurality of pixel rows during successive passes of the print head over the substrate, an improved process for printing onto the substrate, the improvement comprising:

(a) jetting one or more ink droplets onto the odd numbered rows in a print region comprising consecutive pixel rows i to 2^n-1, during a pass of the print head, where n is a positive integer and i is either 1 or 2;

(b) jetting one or more ink droplets onto the even numbered rows in the same print region, in the next pass of the print head;

(c) jetting one or more ink droplets onto the odd numbered rows in another print region comprising consecutive pixel rows beginning with the first pixel row following the last pixel row of the immediately preceding print region and ending with the 2^n-3 pixel row thereafter, during the next pass of the print head; and

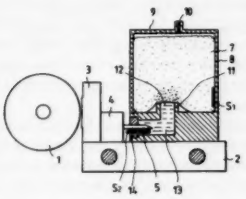
(d) jetting one or more ink droplets onto the even numbered rows in the print region of step (c), in the next pass of the print head.

5,070,346

INK NEAR-END DETECTING DEVICE

Seiji Mochizuki; Takahiro Naka; Kazuhiko Hara; Akira Takagi, and Yukihiro Hanaoka, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Jan. 18, 1991, Ser. No. 642,761
Claims priority, application Japan, Jan. 30, 1990, 2-21022; Mar. 20, 1990, 2-70318; Nov. 29, 1990, 2-332640
Int. Cl.[5] B41J *2/175;* G01D *18/00*
U.S. Cl. 346—140 R **6 Claims**



1. An ink near-end detecting device comprising:

means for forming an ink pool communicating with a printing head, said ink pool being formed in a lower position of an ink tank which accommodates a porous material containing an aqueous ink;

a pair of electrodes arranged in a part of said porous material and in a part of said ink pool, respectively;

means for supplying at least one signal representing a predetermined resistance reference value; and

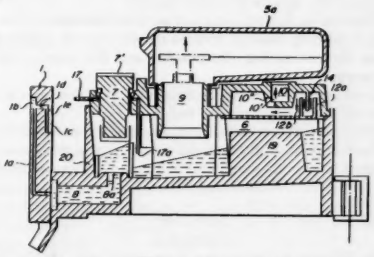
resistance change detecting means for detecting a condition that said ink in said ink tank has been nearly used up from a change of the resistance between said electrodes of more than said predetermined reference resistance value.

5,070,347

CYLINDRICAL WALL MEMBER FOR INK LIQUID RESEVOIR MOUNTED ON A CARRIAGE IN AN INK JET SYSTEM PRINTER

Yoshio Yuki, Nabari, and Takafumi Hara, Tsuzuki, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 1,196, Jan. 7, 1987, abandoned, which is a continuation of Ser. No. 681,251, Dec. 13, 1984, Pat. No. 4,658,273. This application Jun. 7, 1990, Ser. No. 536,935
Claims priority, application Japan, Dec. 16, 1983, 58-194578
The portion of the term of this patent subsequent to Apr. 14, 2004, has been disclaimed.
Int. Cl.[5] B41J *2/175*
U.S. Cl. 346—140 R **4 Claims**



1. An ink liquid supply system for an ink jet printer having a printing head mounted on a carriage, said system comprising:

ink liquid reservoir means, mounted on said carriage within said printing head for maintaining a supply of ink liquid, said ink liquid reservoir means including an upper ceiling wall with an opening therein and a base portion opposing said ceiling wall;

ink liquid cartridge means, removably mounted on said ink liquid reservoir means, for supplying the ink liquid into said ink liquid reservoir means through said opening;

conduit means for delivering the ink liquid from said ink liquid reservoir means to said printing head, said ink liquid conduit means having an ink liquid inlet disposed in the base portion of said ink liquid inlet disposed in the base portion of said ink liquid reservoir means for communicating therewith; and

a wall member disposed around said ink liquid inlet of said conduit means, said wall member being substantially cylindrical and terminating at an upper end thereof in a slanted free top end having a highest portion thereof facing away from said printing head and a lowest portion thereof facing said printing head, said wall member further including an inner radius greater than the radius of said ink liquid inlet for providing a recess containing an extra amount of the ink liquid for preventing air from entering said conduit means and interrupting the flow of ink from said ink liquid reservoir means to said printing head via said ink liquid inlet even in the event said ink jet printer is inclined.

5,070,348

WATERPROOF AND/OR WATER-RESISTANT CAMERA

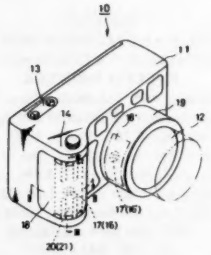
Masahiro Hayakawa, and Kosei Kosako, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 11, 1990, Ser. No. 580,604

Claims priority, application Japan, Sep. 13, 1989, 1-107343[U]; Dec. 22, 1989, 1-148266[U]; Dec. 26, 1989, 1-149648[U]; Dec. 26, 1989, 1-149649[U]; Jan. 18, 1990, 2-3458[U]; Feb. 27, 1990, 2-19329[U]

Int. Cl.[5] G03B *17/08*

U.S. Cl. 354—64 45 Claims



1. A waterproof and/or water-resistant camera, comprising:

a movable photographing lens barrel which moves in the optical axis direction of the camera;

said camera including a curved surface portion;

an air breathing passage formed in said curved surface portion for connecting the interior and the exterior of the camera;

an air-permeable and water-impermeable filter provided in the air breathing passage, and,

a protection cover which covers the air-permeable and water-impermeable filter and constitutes an air connecting means for the air-permeable and water-impermeable filter.

5,070,349

CAMERA

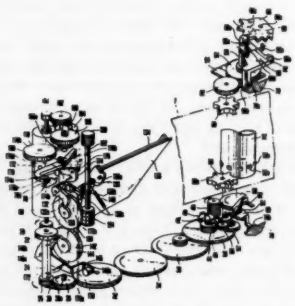
Shosuke Haraguchi; Masaharu Kawamura, and Hideki Morishima, all of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 3, 1989, Ser. No. 305,706

Claims priority, application Japan, Feb. 8, 1988, 63-028191; Feb. 8, 1988, 63-028192; Feb. 8, 1988, 63-028193

Int. Cl.[5] G03B *1/12*

U.S. Cl. 354—152 28 Claims



1. A motor-driven camera comprising:

a) a motor;

b) a mirror driving mechanism, arranged to use an output of said motor as a drive source, for moving a movable mirror from a view-finder sight position to an exposure-allowing retracted position on the basis of a rotation of said motor in a first direction and for returning said movable mirror back to the view-finder sight position according to a continuous rotation of said motor in said first direction;

c) a film transporting mechanism, arranged to use the output of said motor as a drive source, for transporting a film for a next frame photographing according to a the rotation of said motor in a second direction;

d) a clutch for changing over the output of said motor between to be transmitted to said mirror driving mechanism according to the rotation of said motor in said first direction and to be transmitted to said film transporting mechanism according to the rotation of said motor in said second direction; and

e) a control circuit for controlling the rotation of said motor, said control circuit being arranged to cause said motor to rotate in said first direction to move said movable mirror to said exposure-allowing retracted position in response to a photographing initiating operation, to cause said motor to rotate in said first direction to return said movable mirror to said view-finder sight position in response to completion of an exposure and, after that, to cause said motor to rotate in said second direction to transport said film for a next frame photographing.

5,070,350

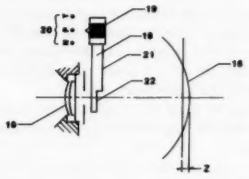
FIELD CURVATURE EFFECTS MINIMIZED IN TELE/PAN CAMERA

Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 468,344, Jan. 22, 1990, abandoned. This application Apr. 8, 1991, Ser. No. 681,654

Int. Cl.[5] G03B *1/18*

U.S. Cl. 354—195.1 7 Claims



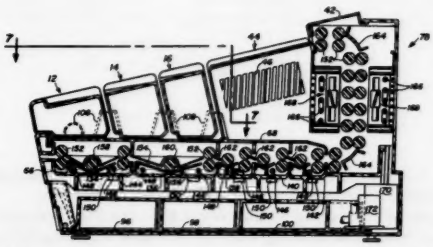
1. Apparatus for improving overall image sharpness at the film plane in a camera which exposes film frames to record pseudo format images, such as pseudo telephoto and pseudo panoramic format images, as selected by camera user operated format changing means, which images will be printed from less than all of the image area of exposed film frames, different film frame portions, smaller than the full film frame, being printed for different pseudo format images, said camera having a taking lens, the field curvature of which at the film plane is of such large magnitude that the lens focus is at a compromise position which provides substantially unsharp pseudo format images unless specially adjusted for each type of pseudo image, center focus of the lens normally being substantially spaced from the film plane in one direction and edge focus being substantially spaced from the film plane in the opposite direction; said apparatus comprising:

means under the control of said format changing means, for moving the center focus of the lens to a position of optimum spacing from the film plane substantially only for the film frame portion to be printed in the pseudo format selected, so as to provide the best overall focus and improved average sharpness substantially only in the film frame portion used for that format.

5,070,351
METHOD AND APPARATUS FOR PROCESSING PHOTOSENSITIVE MATERIAL

Joel L. Vanover, Elkton; Jon F. Boyer, Earleville, both of Md.; Douglas J. Hohlbein, Central Islip, N.Y.; Anthony P. Montalbano, Bayville, N.Y.; Christopher P. Montalbano, Great Neck, N.Y., and John G. Van Remoortel, Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 13, 1989, Ser. No. 421,216
Int. Cl.[5] G03D *3/06*
U.S. Cl. 354—299 **27 Claims**



1. An apparatus for processing a sheet or web of photosensitive material comprising:

means for holding process developer solution;

means for holding process fixer solution;

a wash system comprising a plurality of wash stations including a first and a last station and means for directing wash solution through the plurality of wash stations in a countercurrent arrangement to the direction of material transport for washing the material;

a dryer for drying the material;

means for transporting the material in order through the process developer solution when the process developer solution is in the first holding means, the process fixer solution when the process fixer solution is in the second holding means, the process wash solution when the process wash solution is in the plurality of wash stations and the dryer;

first means for holding and supplying replenishment developer solution to the first holding means;

second means for holding and supplying replenishment fixer solution to the second holding means; and

third means for holding and supplying replenishment wash solution to the last station of the wash system,

wherein the volume of replenishment wash solution supplied to the wash system comprises no more than about 50 milliliters per square foot (538.2 milliliters per square meter) of material processed by the apparatus.

5,070,352
RANGE FINDING DEVICE FOR CAMERAS

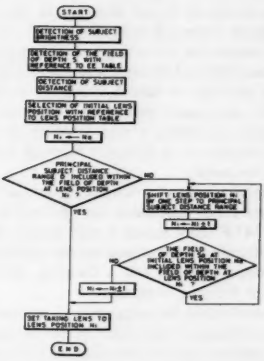
Takaaki Kotani, and Seiji Takada, both of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 18, 1988, Ser. No. 182,724
Claims priority, application Japan, Apr. 17, 1987, 62-94932; Apr. 17, 1987, 62-94933; Apr. 17, 1987, 62-94934
Int. Cl.[5] G03B *3/00, 13/18*
U.S. Cl. 354—402 **4 Claims**

3. A range finding device for use on an automatic focusing camera having a plurality of light receiving elements for receiving light reflected from subjects at different distances in the field, respectively, each light receiving element providing a distance signal representative of a different subject distance according to which one of a plurality of lens positions is selected for adjusting a taking lens, said device comprising:

initial lens position detecting means for detecting one of a plurality of lens positions according to said distance signal, to any one of said plurality of lens positions a taking lens of said camera is adapted to be selectively adjusted;

means for detecting the depth of field of said taking lens at said initial lens position according to subject brightness; and

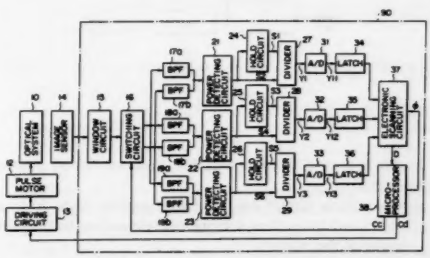

START
DETECTION OF SUBJECT BRIGHTNESS
DETECTION OF THE FIELD OF DEPTH δ WITH REFERENCE TO EE TABLE
DETECTION OF SUBJECT DISTANCE
SELECTION OF INITIAL LENS POSITION WITH REFERENCE TO LENS POSITION TABLE
PRINCIPAL SUBJECT DISTANCE RANGE FALLS WITHIN FIELD OF DEPTH AT LENS POSITION
NO
YES
SHIFT LENS POSITION IN BY ONE STEP TO PRINCIPAL SUBJECT DISTANCE RANGE
IS THE FIELD OF DEPTH AT INITIAL LENS POSITION IN INCLUDED WITHIN THE FIELD OF DEPTH AT LENS POSITION
NO
YES
SET TAKING LENS TO LENS POSITION
END

means for shifting said initial lens position toward a final subject distance range that includes a shortest distance of from 1.5 to 3 m. when a subject distance range defined by said depth of field includes said final subject distance range.

5,070,353
AUTOMATIC FOCUSING APPARATUS

Yasuhiro Komiya, Hachioji, and Tatsuo Nagasaki, Yokohama, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 458,166, Dec. 28, 1989, Pat. No. 4,998,416. This application Nov. 27, 1990, Ser. No. 618,463
Claims priority, application Japan, Jan. 9, 1989, 1-2483; Dec. 8, 1989, 1-317738
The portion of the term of this patent subsequent to Feb. 5, 2008, has been disclaimed.
Int. Cl.[5] G03B *13/00*
U.S. Cl. 354—402 **11 Claims**



1. An automatic focusing apparatus, comprising:

an optical system, having a predetermined focal plane and an optical axis, for forming an optical image of an object;

means for moving said focal plane in a direction of the optical axis;

storage means for storing MTF (Modulation Transfer Function) ratios, defocus amounts, focusing directions, and focusing states corresponding to the MTF ratios, said MTF ratios being ratios of first MTF values corresponding to a plurality of first spatial frequencies at a first position near the focal plane to second MTF values corre-

sponding to a plurality of second spatial frequencies at a second position near the focal plane;

an image sensor for detecting the optical image of the object formed by said optical system with said focal plane being moved, and for outputting image signals;

spatial frequency component extracting means for extracting a plurality of spatial frequency components corresponding to the plurality of spatial frequencies from the image signals output from said image sensor;

calculating means for extracting spatial frequency components in two different focusing states of said optical system from the plurality of spatial frequency components extracted by said spatial frequency component extracting means, and calculating a ratio between the spatial frequency components in different focusing states at every common frequency;

defocus detecting means for comparing the spatial frequency component ratios calculated by said calculating means with the MTF ratios stored in said storage means, determining a focusing state of said optical system, and detecting a defocus amount and a focusing direction in the determined focusing state; and

driving control means for calculating an amount and a direction of movement of said focal plane on the basis of the defocus amount and the focusing direction detected by said defocus detecting means, and for outputting the calculation result to said moving means to move the focal plane to a focusing point.

5,070,354

EXPOSURE CONTROL UNIT FOR A MOTOR-DRIVEN SHUTTER

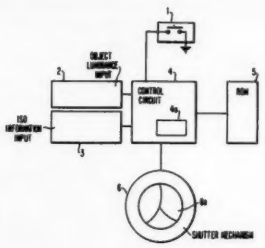
Kanji Ito, and Mitsuhiro Kakuta, both of Tokyo, Japan, assignors to Seikosha Co., Ltd., Tokyo, Japan

Filed Jul. 9, 1990, Ser. No. 549,778

Claims priority, application Japan, Jul. 10, 1989, 1-177593

Int. Cl.[5] G03B *7/00*

U.S. Cl. 354—412 **3 Claims**



1. An exposure control unit for a motor-driven shutter, comprising:

a photometric circuit for receiving incident light from an object and outputting a signal corresponding to the luminance of the object;

a motor-driven shutter coupled to be driven by a motor rotating in response to exposure data;

an exposure data table storing exposure data corresponding to a series of different values of object luminance, for controlling said motor-driven;

means for accessing a set of said exposure data in said table which are above and below the value corresponding to said luminance signal and for generating an exposure data corresponding to said luminance signal in response to the data accessed thereby, by linear approximation, for controlling said motor.

5,070,355

CAMERA SYSTEM CAPABLE OF RECORDING INFORMATION IN AN EXTERNAL MEMORY

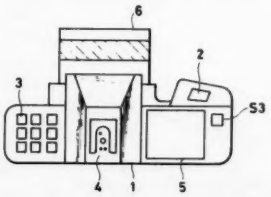
Manabu Inoue; Nobuyuki Taniguchi; Katsuyuki Nanba; Yoshinobu Kudo; Michihiro Iwata, and Shigeru Wada, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed May 18, 1990, Ser. No. 524,808

Claims priority, application Japan, May 22, 1989, 1-126597

Int. Cl.[5] G03B *7/00*

U.S. Cl. 354—413 **6 Claims**



1. A camera system including a camera body and a flash light device, comprising:

means for judging whether or not a red-eye effect will occur when said flash light device is fired at a photographing operation of said camera system, to produce a red-eye signal when the possibility of occurrence of the red-eye effect is judged;

external memory means detachably mounted on said camera body, for storing a plurality kinds of photographing conditions; and

means for writing information representative of the possibility of occurrence of the red-eye effect in said external memory means in accordance with said red-eye signal.

5,070,356

CAMERA HAVING TELEVISION MODE

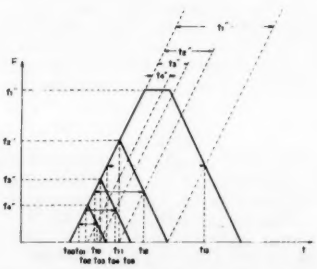
Yoshio Nakamura, Funabashi; Junichi Shinohara, Yokohama, and Daisuke Kishida, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 4, 1990, Ser. No. 592,634

Claims priority, application Japan, Oct. 9, 1989, 1-118504[U]; Jan. 9, 1990, 2-376[U]; Jun. 8, 1990, 2-61251[U]

Int. Cl.[5] G03B *7/097*

U.S. Cl. 354—439 **9 Claims**



1. A camera having a television mode comprising:

a shutter unit for opening and closing a plurality of shutter blades used as a shutter and a diaphragm by rotating a step motor in normal and reverse directions;

photometric means for performing a photometric operation with respect to a photographed object;

mode switching means for selectively switching a television mode for photographing a picture image on a television screen and a normal mode for performing a normal photographing operation;

a trigger switch for outputting an open signal in synchronization with an operation for opening said shutter blades and outputting a closed signal in synchronization with an operation for closing said shutter blades; and

a calculator for calculating an exposure amount by photometric information provided by said photometric means when the normal photographing mode is selected by said mode switching means;

said calculator converting the calculated exposure amount to a time from a generating time point of the open signal of said trigger switch to a time point of the reverse rotation of said step motor so as to control a program exposing operation with respect to said shutter unit;

said calculator calculating the exposure amount by the photometric information provided by said photometric means when said television mode is selected.

5,070,357

BATTERY CHECK DEVICE FOR CAMERAS

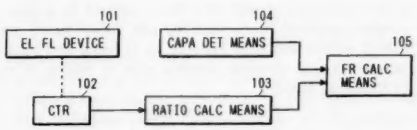
Kazuyuki Kazami, Tokyo; Koichi Daitoku, Sagamihara; Akira Ezawa; Kazuto Ohtsuka, both of Tokyo, and Hideya Inoue, Yokohama, all of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Dec. 3, 1990, Ser. No. 620,746

Claims priority, application Japan, Dec. 5, 1989, 1-315669; Dec. 14, 1989, 1-324519

Int. Cl.[5] G03B *17/18*

U.S. Cl. 354—468 **8 Claims**



1. A battery check device for cameras comprising:

a counting means for counting the number of times photographing is performed by cameras;

a detecting means for detecting the remainder of the capacity of a battery; and

a determining means for determining the number of the remaining pictures which can be taken on the basis of the counted number of times photographing has been performed and the detected remainder of the capacity of the battery.

5,070,358

CUSTOM CONTACT PRINTER FOR SELECTIVE VISUAL CONTACT PRINTING

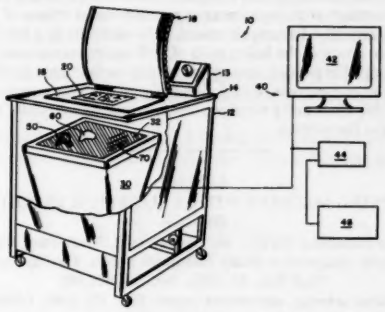
John D. Stouffer, South Bend, and Ellen Y. Deak, Elkhart, both of Ind., assignors to Stouffer Industries Inc., South Bend, Ind.

Filed Mar. 16, 1990, Ser. No. 494,430

Int. Cl.[5] G03B *27/72, 27/80*

U.S. Cl. 355—20 **19 Claims**

1. A contact printer for providing a photographic print in accordance with selective manual control of the contact printer, comprising means for engaging a negative with a clear support, a cathode ray tube disposed adjacent said support and able to emit a light array to the negative, and computer means for controlling the cathode ray tube, the compute means including manual controller means for altering manually, as desired, any selected portion of the light array of the cathode



ray tube according to an operator's visual evaluation of the negative.

5,070,359

PRESSURE DEVELOPING APPARATUS

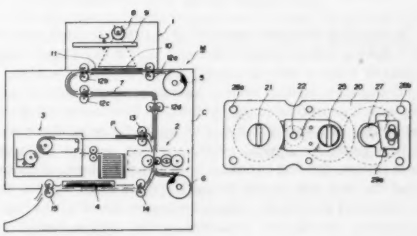
Osamu Nagata, and Keiji Seo, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Japan

Filed Oct. 15, 1990, Ser. No. 597,891

Claims priority, application Japan, Oct. 16, 1989, 1-120645[U]; Oct. 16, 1989, 1-268350; Oct. 16, 1989, 1-268351; Oct. 16, 1989, 1-268352

Int. Cl.[5] G03B *27/52*

U.S. Cl. 355—27 **14 Claims**



1. A pressure developing unit of an image formation system for developing and transferring an image under application of pressure, comprising:

a frame member;

a first roller supported by said frame member to be rotatable about a rotation axis thereof;

a second roller supported by said frame member and having a rotation axis parallel to the rotation axis of said first roller to be rotatable about the rotation axis thereof, said second roller being disposed to be movable to a first position where the second roller contacts with the first roller and to a second position where the second roller separates from the first roller, an image recording sheet being passed between the second roller and the first roller; and

a cam assembly operatively supported by said frame member for applying pressure to said second roller;

said cam assembly comprising cam support means disposed to be movable in directions approaching to and being separated from said second roller, a plurality of cams mounted to said cam support means, elastically deformable means supported by said frame member for applying pressure to said cams by elastic deformation caused by contact by said cams, means mounted to said cam support means for transferring the pressure caused by said elastically deformable means, and means for adjusting a dis-

tance between said cam support means and said elastically deformable applying means;

said distance adjusting means comprising wedge means fitted into bilaterally elongated holes formed in said frame member at portions near supported end portions of said elastically deformable means to be movable in a bilateral direction of the holes, each of said wedge means comprising a flat portion having an inclined surface against which the end portion of said elastically deformable means slidably abuts and a vertical portion extending vertically from the flat portion.

5,070,360

COPYING MACHINE WITH A SLIDEFILM EXPOSURE DEVICE

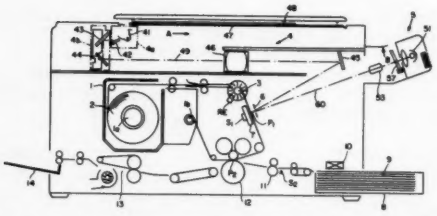
Akira Tamagaki, Soraku, and Shougo Iwai, Moriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 21, 1990, Ser. No. 631,689

Claims priority, application Japan, Dec. 27, 1989, 1-340492; Dec. 28, 1989, 1-344224

Int. Cl.[5] G03B *27/52*

U.S. Cl. 355—40 **2 Claims**



1. A copying machine comprising a first exposure optical system having a first optical axis along which an optical image is directed from a first document to an exposure section, a second exposure optical system having a second optical axis along which an optical image is directed from a second document to said exposure section, and means for selecting either said first exposure optical system or said second exposure optical system, the first exposure optical system being disposed so that the first optical axis forms the same angle against the first document as against a photosensitive material at the exposure section, the second exposure optical system being disposed so that the second optical axis is at the same angle to the second document and the photosensitive material placed at the exposure section.

5,070,361

MOLDED CASE CIRCUIT BREAKER OPERATING MECHANISM ASSEMBLY

Gary D. Magnon, Bristol; Raymond K. Seymour; David J. Lesslie, both of Plainville; Michael C. Guerrette, Plymouth, and Geoffrey H. McKay, West Hartford, all of Conn., assignors to General Electric Company, N.Y.

Filed Nov. 30, 1990, Ser. No. 620,174

Int. Cl.[5] H01H *9/00*

U.S. Cl. 335—172 **7 Claims**

1. A molded case electric circuit breaker comprising:

a plastic cover and case;

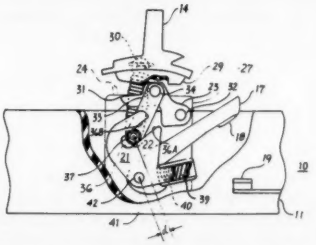
a fixed and a movable contact arranged for connection with an external electric circuit, said movable contact being attached to one end of a movable contact arm;

an operating mechanism within said case arranged for moving said movable contact arm and said attached movable contact to automatically interrupt current through said external circuit upon occurrence of an overcurrent condition;

an operating handle externally-accessible through said cover and operably connected with said operating mechanism for manually moving said movable contact arm and said attached movable contact between open and closed positions;

a pair of operating springs within said operating mechanism moving to an over-center position and providing an opening force and a closing force on said movable contact arm when said operating handle moves said movable contact arm and said attached movable contact between said open and closed positions;

a pair of contact springs abutting an opposite end of said movable contact arm, said contact springs providing a reverse bias force to said movable contact arm to hold said attached movable contact against said fixed contact;



an operating cradle pivotally-attached within said operating mechanism retaining said movable contact arm against a tripping force provided by said operating springs;

a cradle link pivotally-attached to said operating cradle at one end and carrying roller means at an opposite end; and

a slotted cam connected with said movable contact arm and moving said movable contact arm in unison with said operating handle, said slotted cam including a pair of linear slots each of said slots being defined by a pair of parallel opposing sides, whereby said roller means positioned within said slots provide an opening and closing torque on said movable contact arm in excess of said reverse bias force.

5,070,362

IMAGE FORMING APPARATUS HAVING A PLURALITY OF SELECTIVELY OPERABLE DEVELOPERS

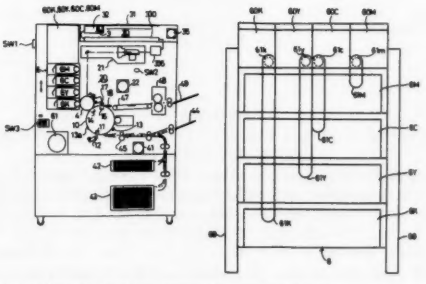
Takashi Noda, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Feb. 21, 1990, Ser. No. 482,800

Claims priority, application Japan, Feb. 21, 1989, 1-41382; Feb. 21, 1989, 1-41383; Feb. 21, 1989, 1-41384

Int. Cl.[5] G03G *15/06*

U.S. Cl. 355—206 **56 Claims**



1. An image forming apparatus, comprising:

a developing unit which is provided with a plurality of developing devices and movable relative to a photoconductor;

a means for setting a predetermined operational condition;

a driving means for moving the developing unit to a supply position;

a detecting means for detecting a shortage of developer in the developing device and outputting a shortage signal; and

a control means for controlling operation of the driving means corresponding to a condition set when the shortage signal is output.

5,070,363

COUNTING SYSTEM FOR USE IN A COPYING MACHINE

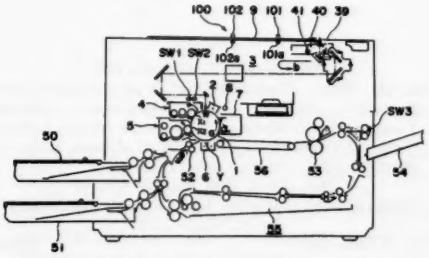
Masazumi Ito, and Yoichi Utsunomiya, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 137,187, Dec. 23, 1987, Pat. No. 4,897,697. This application Feb. 17, 1989, Ser. No. 311,979

Claims priority, application Japan, Jul. 3, 1987, 62-167568

Int. Cl.[5] G03G *15/01, 21/00*

U.S. Cl. 355—206 **17 Claims**



1. An image forming apparatus comprising:

forming means for forming an electrostatic latent image on a photosensitive member;

a developing station for developing the electrostatic latent image formed on the surface of the photosensitive member, including plural different kinds of the developing units;

processing means for selectively operating two developing units to form a double colored image;

determining means for determining whether or not the two developing units which are operated by said processing means contain the same developing color; and

warning means for sending a warning when said detecting means detects that said two developing units have the same developing color.

5,070,364

PRINTING MEMBER FOR ELECTROSTATIC PHOTOCOPYING

Shunpei Yamazaki, Tokyo, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Division of Ser. No. 452,355, Dec. 19, 1989, Pat. No. 4,999,270, which is a division of Ser. No. 116,337, Nov. 2, 1987, Pat. No. 4,889,783, which is a division of Ser. No. 814,083, Dec. 24, 1985, abandoned, which is a continuation of Ser. No. 502,583, Jun. 9, 1983, abandoned, which is a division of Ser. No. 276,503, Jun. 23, 1981, Pat. No. 4,418,132. This application Sep. 4, 1990, Ser. No. 577,006

Claims priority, application Japan, Jun. 25, 1980, 55-86801

Int. Cl.[5] G03G *15/22*

U.S. Cl. 355—211 **4 Claims**

1. An electrostatic photocopying machine comprising:

(a) a printing member including

a conductive substrate;

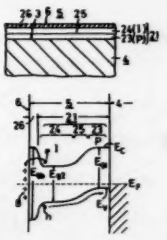
a non-single-crystal p-type or n-type first semiconductor layer formed on said conductive substrate;

a non-single-crystal intrinsic or substantially intrinsic second semiconductor layer formed on said first semiconductor layer;

a non-single-crystal intrinsic or substantially intrinsic insulating or semi-insulating third layer formed on said second layer with an external surface to permit the passage of photo-generated charge so that charge on the external surface can be neutralized;

where the band gap continuously changes at the interface between said second semiconductor layer and said third layer;

where said first layer, said second layer, and said insulating or semi-insulating layer are selected from the group



consisting of silicon, silicon with nitrogen, silicon with carbon and silicon with oxygen either in stoichiometric or non-stoichiometric amounts;

(b) means for providing said charge on said external surface of the insulating layer or semi-insulating layer of the printing member;

(c) means for projecting a light image onto said external surface of said insulating or semi-insulating layer to thus form an electrostatic charge image; and

means for developing the electrostatic charge image to form a visible image pattern on the insulating layer of the printing member.

5,070,365

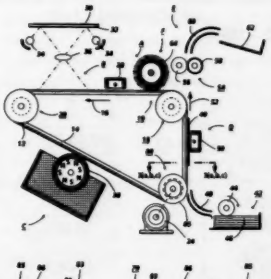
LOW LATERAL FORCE DRIVE ROLLER SYSTEM

Vinod K. Agarwal, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 20, 1990, Ser. No. 630,573

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—212 **9 Claims**



1. An apparatus for supporting a belt arranged to move in a predetermined path and for controlling lateral movement of the belt from the predetermined path, comprising: at least one rotatably mounted roller that includes a shaft; and dual oppositely wound helical springs fixed to said shaft, and wherein

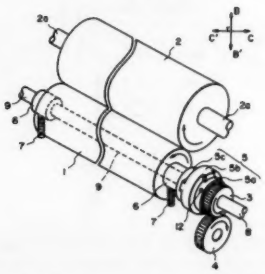
said oppositely wound helical springs are separately and individually coated with a high friction material.

5,070,366

IMAGE FORMING APPARATUS FEATURING A CONSTANT CONTACT-PRESSURE DRIVE

Yoshiro Tsuchiya, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 9, 1990, Ser. No. 491,154
Claims priority, application Japan, Mar. 10, 1989, 1-59038
Int. Cl.[5] G03G *15/02*
U.S. Cl. 355—219 **44 Claims**



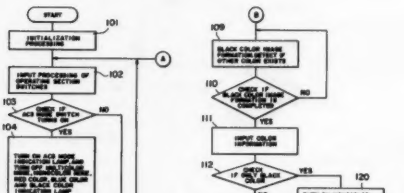
1. An image forming apparatus, comprising:
a movable image bearing member;
a rotatable member press-contacted to said image bearing member in relation to an image forming process for forming an image on said image bearing member, said rotatable member having a longitudinal shaft;
driving means for driving said rotatable member; and
transmission means for transmitting a driving force to the shaft of said rotatable member from said driving means, said transmission means having coupling means for transmitting a rotational force substantially without imparting to said shaft a force in a radial direction thereof.

5,070,367

COLOR IMAGE FORMING APPARATUS WITH AN AUTOMATIC COLOR SELECTION MODE

Masahi Sugano; Takashi Murahashi; Hiroyuki Maruyama, and Jun Yokobori, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Jan. 24, 1991, Ser. No. 645,098
Claims priority, application Japan, Feb. 5, 1990, 2-25667
Int. Cl.[5] G03G *15/01*
U.S. Cl. 355—326 **2 Claims**



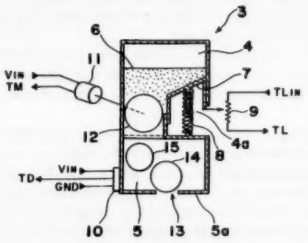
1. A color image forming apparatus having an automatic color selection mode to determine a color to be used and a copy process to be conducted in accordance with the color obtained by distinguishing a color composition of an original document, comprising:
(a) means for setting the automatic color selection mode;
(b) an image reading means for reading the original document by scanning and for separating the original document into a plurality of colors, wherein, when the automatic color selection mode is set, a scanning for a predetermined color out of the plurality of colors is carried out to form an image for the predetermined color, and the presence of color other than the predetermined color is detected during the scanning;
(c) an image processing means for outputting image information of the detected colors; and
(d) a control means for judging the necessity of forming images for the detected colors based on the image information and for controlling the copy process for the detected colors.

5,070,368

DEVELOPING APPARATUS

Tokiyuki Okano, Yamatokoriyama; Kiyoshi Inamoto, Sakai; Kazuyuki Ohnishi, Nara; Hidetomo Nishiyama, Yamatokoriyama; Kazunori Sohda, Nara; Masato Tokishige, Nara, and Yoichi Shimazawa, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 5, 1990, Ser. No. 475,344
Claims priority, application Japan, Feb. 15, 1989, 1-16597[U]
Int. Cl.[5] G03G *21/00*
U.S. Cl. 355—246 **9 Claims**



1. A developing apparatus comprising:
a plurality of developing units each including a hopper and a developing tank;
a permeability sensor provided in connection with the developing tank for each of said plurality of developing units, said permeability sensor automatically determining whether a concentration of toner within the developing tank is below a predetermined value;
a level sensor provided in connection with the hopper for each of said plurality of developing units, said level sensor automatically determining whether a level of toner within the hopper is below a predetermined level;
control means for controlling said permeability sensor and said level sensor, wherein detection by said permeability sensor of a concentration of toner below the predetermined value in a developing tank of any one of said plurality of developing units initiates detection by said level sensor in each hopper for each of said plurality of developing units for determining whether the level of toner therein is below the predetermined level; and
means for indicating a need for toner replenishment in a respective one of said plurality of developing units in response to automatic determination by said level sensor.

5,070,369

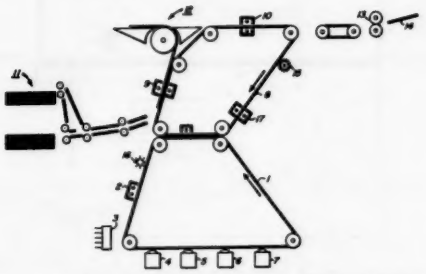
ELECTROSTATOGRAPHIC METHOD AND APPARATUS FOR PRODUCING MULTICOLOR DUPLEX REPRODUCTIONS

Gregory P. Mahoney, Fairport, and Bruce R. Benwood, Churchville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 119,370, Nov. 10, 1987, abandoned. This application Jan. 31, 1989, Ser. No. 304,093

Int. Cl.[5] G03G *15/01, 15/14, 21/00*

U.S. Cl. 355—271 3 Claims



1. A method of producing multicolor duplex reproductions comprising:

forming a plurality of electrostatic images, alternate images defining single color components of first and second multicolor images, respectively;

toning said electrostatic images with toners, which toners are of different color for the electrostatic images corresponding to each multicolor image;

transferring in registration the toner images intended for the first and second multicolor images to first and second portions of an intermediate member, respectively, to form first and second multicolor toner images; and

then transferring said first multicolor toner image to a first side of a copy sheet, and said second multicolor toner image to a second side of said copy sheet.

5,070,370

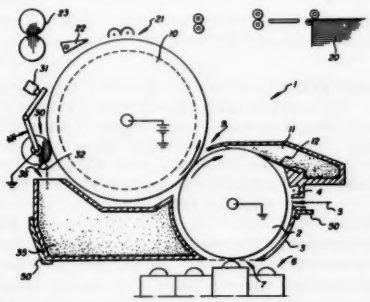
IMAGE-FORMING APPARATUS HAVING A REPLACEABLE CARTRIDGE AND A TRANSFER MEMBER CLEANING DEVICE

Edson F. Bellis, Macedon, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 24, 1990, Ser. No. 632,710

Int. Cl.[5] G03G *15/14*

U.S. Cl. 355—271 20 Claims



1. An image-forming apparatus including:

an image member,

a transfer member having a peripheral surface for receiving a toner image from said image member,

means for creating an electrostatic image on said image member,

means for toning said electrostatic image to create a toner image,

means for transferring said toner image to said peripheral surface of said transfer member,

means for transferring a toner image from said peripheral surface to a receiving sheet,

means for cleaning said transfer member of toner,

a single replaceable cartridge, which includes both said image member and means for receiving toner cleaned from said transfer member.

5,070,371

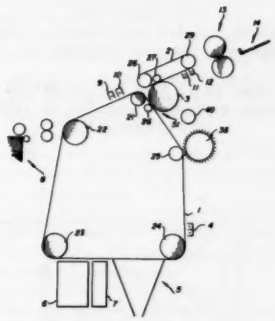
METHOD AND APPARATUS FOR HANDLING TONER IMAGES

Kent A. Randall, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 22, 1990, Ser. No. 601,539

Int. Cl.[5] G03G *15/14, 15/01*

U.S. Cl. 355—272 15 Claims



1. Apparatus for forming duplex toner images on a receiving sheet, said apparatus comprising:

means for forming first and second toner images on an image member,

means for transferring said first toner image from said image member to a first intermediate member,

means for transferring said first toner image from said first intermediate member to a second intermediate member,

means for transferring said second toner image from said image member to a first side of a receiving sheet, and

means for transferring said first toner image from said second intermediate member to the other side of said receiving sheet to create duplex toner images on said receiving sheet.

5,070,372

METHOD AND APPARATUS OF FORMING COMBINED TONER IMAGES

Kent A. Randall, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

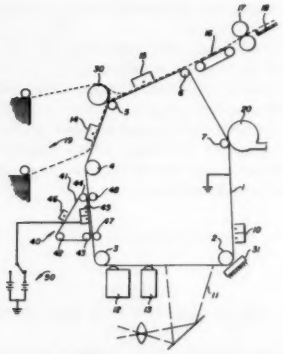
Filed Oct. 22, 1990, Ser. No. 601,629

Int. Cl.[5] G03G *15/14, 15/16*

U.S. Cl. 355—272 17 Claims

1. A method of forming combined toner images comprising:

forming first and second toner images on an image member, transferring said first image to an intermediate member, and



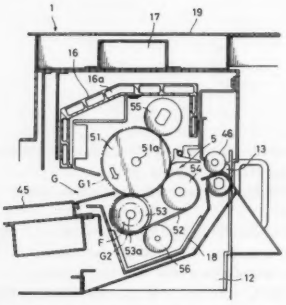
transferring said first image back to said image member in registration with said second image to form a combined toner image on said image member.

5,070,373

FIXING DEVICE

Masahiko Fukano, and Toshinori Muraoka, both of Osaka, Japan, assignors to 501 Mita Industrial Co., Ltd., Osaka, Japan

Filed Feb. 22, 1990, Ser. No. 483,554
Claims priority, application Japan, Feb. 23, 1989, 1-44345
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—290 **3 Claims**



1. A device for fixing toner images transferred onto the surface of a paper comprising:

(i) a heating roller;

(ii) first driving means for driving said heating roller;

(iii) a pressure belt which comes into contact with and is driven with said heating roller; and

(iv) second driving means for driving said pressure belt at a lower peripheral speed than that of said heating roller when slippage occurs between said heating roller and the paper and between the paper and said pressure belt so that the peripheral speed of said pressure belt becomes lower than that of said heating roller,

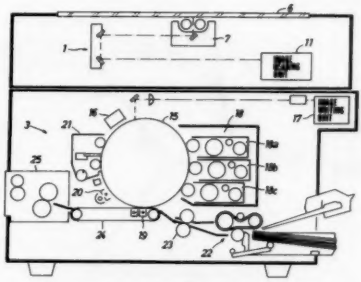
wherein the second driving means includes a one-way clutch which allows racing of said pressure belt in a paper delivery direction so that said pressure belt can be rotated at the same peripheral speed as that of said heating roller when the slippage does not occur between said heating roller and the paper and between the paper and said pressure belt.

5,070,374

COLOR IMAGE FORMING APPARATUS

Takashi Murahashi; Masashi Sugano; Hiroyuki Maruyama, and Jun Yokobori, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Dec. 5, 1990, Ser. No. 622,595
Claims priority, application Japan, Dec. 6, 1989, 1-317292; Dec. 6, 1989, 1-317293
Int. Cl.[5] G03G *15/01*
U.S. Cl. 355—326 **3 Claims**



1. A color image forming apparatus comprising:

an image reading means for reading an image of an original by scanning said original and separating said scanned image into at lest two colors;

an image processing means for processing the output from said image reading means to output at least two-color image data;

an image recording means for forming at least two color images in an image region of an image retainer on the basis of said image data and transferring said at least two-color images onto a copying paper;

wherein said color image forming apparatus is designed to operate in a continuous page copying mode for copying images on two pages of said original onto two copying papers page by page and/or in an automatic color selection mode for automatically determining available colors and copying processes compatible with said available colors by discriminating chromatic conditions of the image of said original by executing a preliminary scanning operation prior to a normal scanning operation;

a color discriminating means for discriminating chromatic conditions of the first and second pages separately by said preliminary scanning under said continuous page copying mode, and said automatic color selection mode and;

a color control means for automatically determining available colors and copying processes on the basis of color data for the first page and likewise, available colors and copying processes on the basis of color data for the second page.

5,070,375

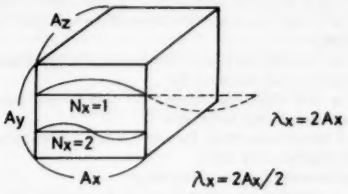
SEMICONDUCTOR DEVICE HAVING A COUPLED QUANTUM BOX ARRAY STRUCTURE

Hiroyuki Sakai, Yokohama, Japan, assignor to Research Development Corporation of Japan, Tokyo, Japan

Filed Nov. 17, 1989, Ser. No. 437,571
Claims priority, application Japan, Nov. 19, 1988, 63-293336
Int. Cl.[5] H01L *27/12*
U.S. Cl. 357—4 **6 Claims**

1. A semiconductor device having a coupled quantum box array structure, comprising a plurality of quantum boxes alternatingly arranged with a plurality of barriers, in which electronic states have energy minibands of finite width and energy gaps of finite width, each potential of said barriers being sufficiently high to confine electrons within respective ones of said

plurality of quantum boxes, and each width of said barriers being sufficiently small to permit electrons to move between



said quantum box through corresponding ones of said barriers by quantum tunneling.

5,070,376

SEMICONDUCTOR DEVICE

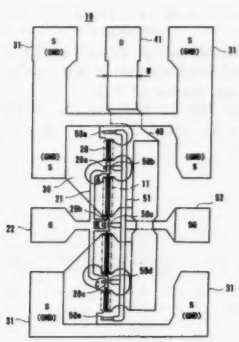
Nobuo Shiga, Yokohama, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 21, 1990, Ser. No. 631,909

Claims priority, application Japan, Jan. 5, 1990, 2-247; Jan. 5, 1990, 2-248; Jan. 5, 1990, 2-250; Jan. 5, 1990, 2-251

Int. Cl.[5] H01L *29/80*

U.S. Cl. 357—22 **8 Claims**



1. A semiconductor device having a FET which is controllable by a microwave control signal, said FET comprising:

a semiconductor substrate;

a source region formed on said substrate;

a drain region formed on said substrate;

a gate region provided between said source and drain regions;

a gate electrode formed on said gate region, said gate electrode comprising a Shottky metal and having a plurality of feed points;

a control input terminal to which a microwave control signal can be applied;

electrical lead wires; and

a plurality of control electrodes connected to said control input terminal by said lead wires, said control electrodes comprising Ohmic metal, each control electrode being electrically coupled to said gate region under a portion of said gate electrode, said control electrodes each extending outwardly from said gate region, said electrical lead wires having lengths from said control electrodes to said control input terminal such that a difference in the lengths of two of said lead wires is shorter than one quarter of the wavelength of a control signal applied to said control input terminal.

5,070,377

SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

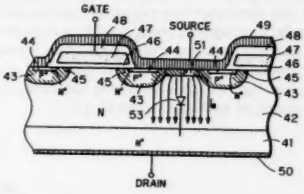
Masana Harada, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 16, 1990, Ser. No. 598,145

Claims priority, application Japan, Feb. 15, 1990, 2-34661

Int. Cl.[5] H01L *29/78*

U.S. Cl. 357—23.4 **11 Claims**



1. A semiconductor device, comprising:

a first conductivity type semiconductor layer having first and second major surfaces;

a second conductivity type first semiconductor region selectively formed in said first major surface of said semiconductor layer;

said first semiconductor regions being composed of a first portion of relatively low impurity concentration and relatively small thickness existing in a center of said first semiconductor region and a second portion of relatively high impurity concentration and relatively large thickness existing adjacently to and outside said first portion, wherein said first portion of said first semiconductor region is smaller in thickness than a diffusion length of a hole;

a first conductivity type second semiconductor region selectively formed in a surface of said second portion of said first semiconductor region;

a surface portion of said second portion of said first semiconductor region between the first major surface of said semiconductor layer and said second semiconductor region being defined as a channel;

an insulating film formed on said channel;

a gate electrode formed on said insulating film;

a first main electrode formed on said first and second semiconductor regions; and

a second main electrode formed in a side of said second major surface of said semiconductor layer.

5,070,378

EPROM ERASABLE BY UV RADIATION HAVING REDUNDANT CIRCUIT

Yasushi Yamagata, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 410,892, Sep. 22, 1989, abandoned. This application Mar. 28, 1991, Ser. No. 679,146

Claims priority, application Japan, Sep. 22, 1988, 63-239215

Int. Cl.[5] H01L *29/68, 27/01, 29/00, 29/78*

U.S. Cl. 357—23.5 **5 Claims**

3. A semiconductor device comprising:

a semiconductor substrate of one conductivity type;

a strip shape region of an opposite conductivity type selectively formed in said semiconductor substrate, said strip shape region having first and second end portions;

a first insulating film formed on a surface of said semiconductor substrate between said first and second end portions of said strip shape region, said strip shape region and said first insulating film surrounding a portion of said semiconductor substrate;

a transistor formed in said portion of said semiconductor substrate, said transistor including a source region of said opposite conductivity type formed in said portion of said

semiconductor substrate in contact with a part of said strip shape region;

a drain region of said opposite conductivity type formed in said portion of said semiconductor substrate;

a second insulating film formed on a surface of said portion of said semiconductor substrate between said source and drain regions with a thickness substantially equal to the thickness of said first insulating film;

a floating gate electrode formed on said second insulating film;

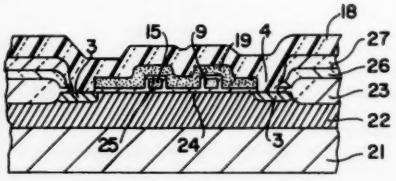
a third insulating film formed on said floating gate electrode;

a control gate electrode formed on said third insulating film;

a first conductive layer crossing said first insulating film;

a second conductive layer crossing said first insulating film;

a fourth insulating film formed on said first and second conductive layers with a thickness substantially equal to the thickness of said third insulating film;



a third conductive layer interconnecting said control gate electrode and said first conductive layer;

a fourth conductive layer interconnecting said drain region and said second conductive layer;

a fifth conductive layer formed on said first and fourth insulating films crossing said first and second conductive layers;

a fifth insulating film covering said strip shape region, said transistor and said first to fifth conductive layers;

a contact hole continuously formed in said fifth insulating film along said strip shape region and said fifth conductive layer, said contact hole surrounding said portion of said semiconductor substrate; and

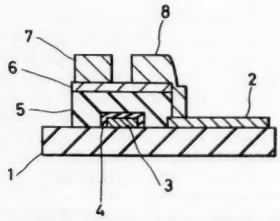
a shield layer formed on said fifth insulating film to cover said transistor, said shield layer being in contact with said strip shape region and said fifth conductive layer through said contact hole.

5,070,379

THIN-FILM TRANSISTOR MATRIX FOR ACTIVE MATRIX DISPLAY PANEL WITH ALLOY ELECTRODES

Tsutomu Nomoto; Masumi Koizumi, and Akihiko Nishiki, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1990, Ser. No. 540,624
Claims priority, application Japan, Jun. 29, 1989, 1-168187
Int. Cl.[5] H01L *29/78*
U.S. Cl. 357—23.7 **4 Claims**



1. A thin film transistor matrix, comprising:

a plurality of thin-film transistors formed on a transparent dielectric substrate and arranged in rows and columns to form a matrix array, each of said transistors comprising:

(a) a control electrode formed as a film on said transparent dielectric substrate;

(b) a first insulator film formed on said control electrode;

(c) a second insulator film formed on said first insulator film;

(d) an amorphous silicon semiconductor layer formed on said second insulator film;

(e) a first electrode formed on said amorphous silicon semiconductor layer; and

(f) a second electrode formed on said amorphous silicon semiconductor layer;

said matrix array further comprising:

(a) a plurality of transparent electrodes formed on said transparent dielectric substrate, contacting said respective second electrodes;

(b) row interconnection layers interconnecting said control electrodes of said transistors of said respective rows; and

(c) column interconnection layers interconnecting said first electrodes of said transistors of said respective columns;

wherein said control electrodes and said row interconnection layers are formed of an alloy of nickel and tantalum; and,

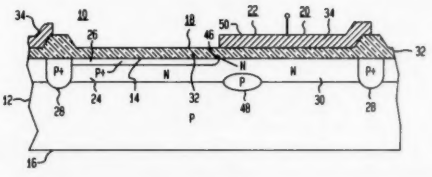
wherein said first insulator film of each of said transistors is composed of an anodized surface of said control electrode and said row interconnection layers.

5,070,380

TRANSFER GATE FOR PHOTODIODE TO CCD IMAGE SENSOR

Herbert J. Erhardt, Rochester; Edward T. Nelson, Pittsford, and Eric G. Stevens, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 13, 1990, Ser. No. 566,934
Int. Cl.[5] H01L *29/78, 27/14, 31/00*
U.S. Cl. 357—24 **14 Claims**



1. An image sensor comprising:

a substrate of a semiconductor material of one conductivity type having a surface;

a pinned diode photodetector in said substrate at said surface, said diode having a first region of a conductivity type opposite that of the substrate in the substrate and having a highly conductive second region of the same conductivity type as the substrate in a portion of the first region and extending to the surface;

a CCD shift register in said substrate spaced from the pinned diode, said CCD shift register including a buried channel region of the opposite conductivity type, first and second conductive gates over the shift register channel region and insulated from the surface of the substrate, the first conductive gate extending along a portion of the adjacent photodetector and the second gate extending along the remaining portion of the adjacent photodetector;

a transfer gate between the channel region of the CCD shift register and the pinned diode including a channel region of the opposite conductivity type in said substrate and an extension of the first conductive gate extending over the transfer gate channel region to the edge of the pinned diode; and

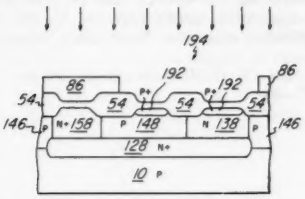
a barrier region of the one conductivity type extending along the transfer gate channel region.

5,070,381

HIGH VOLTAGE LATERAL TRANSISTOR

David B. Scott, Plano, and Hiep V. Tran, Carrollton, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 20, 1990, Ser. No. 496,487
Int. Cl.[5] H01L 29/72, 27/10
U.S. Cl. 357—35 5 Claims



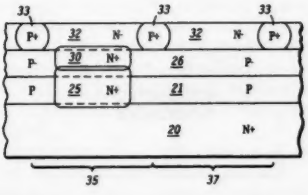
1. A bipolar transistor, comprising:
a substrate having a first conductivity type;
a buried doped region having a second conductivity type opposite said first conductivity type, said buried doped region being spaced from a surface of said substrate;
a first well region formed in said substrate having said first conductivity type, said first well region extending from said surface to said buried doped region;
a second well region formed in said substrate having said second conductivity type, said second well region extending from said surface to said buried region and abutting said first well region;
an electrical contact to said buried doped region serving as a base contact;
a first doped region formed in said first well at said surface and having said first conductivity type, said first doped region serving as a collector contact; and
a second doped region formed in said second well at said surface having said first conductivity type, said second doped region being substantially spaced from said buried doped region, said second doped region serving as an emitter.

5,070,382

SEMICONDUCTOR STRUCTURE FOR HIGH POWER INTEGRATED CIRCUITS

Bertrand Cambou, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 18, 1989, Ser. No. 395,695
Int. Cl.[5] H01L 27/02, 27/04
U.S. Cl. 357—48 14 Claims



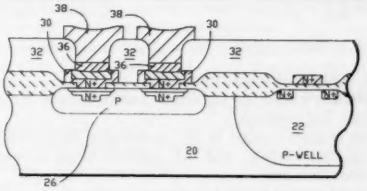
1. A semiconductor structure, comprising:
a substrate of a first conductivity type;
a first epitaxial layer of a second conductivity type, disposed on the substrate and having a first buried layer of a first conductivity type;
a second epitaxial layer of a second conductivity type, disposed on the first epitaxial layer and having a second buried layer of a first conductivity type which is formed over the first buried layer; and
a third epitaxial layer of a first conductivity type disposed on the second epitaxial layer, and having isolation regions extending down to the second epitaxial layer, and surrounding the first and the second buried layers.

5,070,383

PROGRAMMABLE MEMORY MATRIX EMPLOYING VOLTAGE-VARIABLE RESISTORS

Alexander B. Sinar, Cupertino; Levy Gerzberg, Palo Alto, both of Calif.; Yosef Y. Shacham, Haifa, Israel; Ilan A. Blech, Sunnyvale, and Eric R. Sirkin, Palo Alto, both of Calif., assignors to Zoran Corporation, Santa Clara, Calif.

Filed Jan. 10, 1989, Ser. No. 295,274
Int. Cl.[5] H01L 27/02, 27/10, 45/00; G11C 17/06
U.S. Cl. 357—51 6 Claims



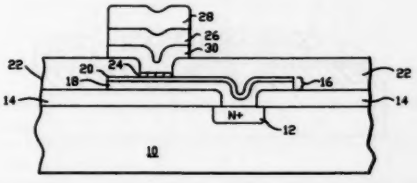
1. A programmable memory array comprising
a monocrystalline semiconductor substrate,
a plurality of word lines formed in said substrate by dopants of a first conductivity type, and
a plurality of stacked diode and voltage-variable resistor structures on each word line with a bit contact to each stacked diode and voltage-variable resistor,
each diode comprising a doped polycrystalline layer of opposite conductivity type in contact with a word line and an ion-implanted region of opposite conductivity type in said word line thereby forming a p-n junction with said word line, and each voltage-variable resistor comprising an amorphized surface region in said polysilicon layer.

5,070,384

ELECTRICALLY PROGRAMMABLE ANTIFUSE ELEMENT INCORPORATING A DIELECTRIC AND AMORPHOUS SILICON INTERLAYER

John L. McCollum, Saratoga, and Shih-Ou Chen, Fremont, both of Calif., assignors to Actel Corporation, Sunnyvale, Calif.

Filed Apr. 12, 1990, Ser. No. 508,306
Int. Cl.[5] H01L 27/02
U.S. Cl. 357—51 41 Claims



1. An electrically programmable antifuse element disposed on a semiconductor substrate in an integrated circuit comprising:
a first electrode,
a dielectric layer disposed over said first electrode,

an amorphous silicon layer disposed over said dielectric layer,

a second electrode disposed over said layer of amorphous silicon.

5,070,385

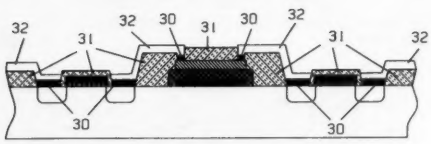
FERROELECTRIC NON-VOLATILE VARIABLE RESISTIVE ELEMENT

Joseph T. Evans, Jr., and Jeff A. Bullington, both of Albuquerque, N. Mex., assignors to Radiant Technologies, Albuquerque, N. Mex.

Filed Oct. 20, 1989, Ser. No. 424,809

Int. Cl.[5] H01L *29/68, 27/02*

U.S. Cl. 357—51 **7 Claims**



1. A resistive element comprising:

a polarizable layer having first and second surfaces comprising a first material;

a first contact bonded to said polarizable layer adjacent to said first surface, said first contact being an electrical conductor; and

a second contact bonded to said polarizable layer adjacent to said second surface, said second contact comprising a semiconducting material which is doped such that the resistance of said second contact changes in response to a change in the polarization of said polarizable layer, said second contact further comprising first and second electrical connections disposed on said second contact such that the resistance of said second contact can be determined by connecting an electrical circuit between said first and second electrical connections, wherein first material and said semiconducting material are chosen such that ions drifting between said polarizable layer and said second contact do not give rise to a layer between said polarizable layer and said second contact having a dielectric constant substantially less than that of said first material.

5,070,386

PASSIVATION LAYER STRUCTURE WITH THROUGH-HOLES FOR SEMICONDUCTOR DEVICE

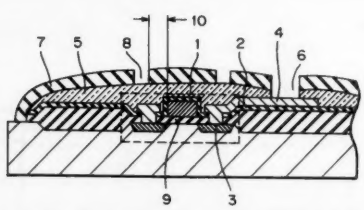
Yukihiro Imura, Tokyo, Japan, assignor to Seiko Instruments Inc., Japan

Filed Jul. 30, 1990, Ser. No. 559,842

Claims priority, application Japan, Aug. 9, 1989, 1-207223

Int. Cl.[5] H01L *29/34, 29/40*

U.S. Cl. 357—52 **9 Claims**



1. A semiconductor device comprising: a semiconductor substrate; a MOS transistor provided on said semiconductor substrate; and a double passivation layer covering said MOS transistor and said semiconductor substrate and comprising a phosphorus silicon nitride layer and a phosphorus silicate glass layer beneath said silicon nitride layer, said double passivation layer having a window only in said phosphorus silicon nitride layer and not in said phosphoros silicate glass layer, said window being effective to permit the escape of contaminants from the semiconductor device.

5,070,387

SEMICONDUCTOR DEVICE COMPRISING UNIDIMENSIONAL DOPING CONDUCTORS AND METHOD OF MANUFACTURING SUCH A SEMICONDUCTOR DEVICE

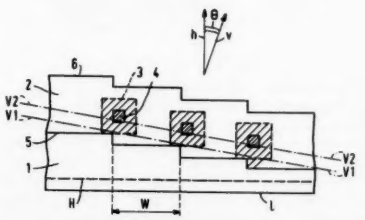
Aart A. Van Gorkum, Eindhoven, Netherlands, assignor to U.S. Philips Corp., New York, N.Y.

Continuation of Ser. No. 495,013, Mar. 15, 1990, abandoned. This application Apr. 19, 1991, Ser. No. 688,373

Claims priority, application Netherlands, Mar. 29, 1989, 8900767

Int. Cl.[5] H01L *29/04, 29/167, 29/20*

U.S. Cl. 357—60 **16 Claims**



1. A semiconductor device comprising a semiconductor body having a semiconductor substrate and a semiconductor layer disposed thereon, said semiconductor layer comprising at least one group of parallel strip-shaped conducting regions having a higher conductivity than that of the semiconductor layer in which the conducting regions are located, said conducting regions comprising strip-shaped subregions completely enclosed within said conducting regions, and doping elements provided within said strip-shaped subregions, the strip-shaped conducting regions and the enclosed strip-shaped subregions being located with a side facing the substrate substantially in a selected plane, which is a vicinal plane of a major crystal surface of the semiconductor body.

5,070,388

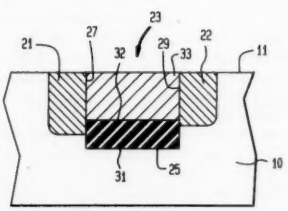
TRENCH-RESIDENT INTERCONNECT STRUCTURE

William R. Wade, Melbourne, and Kenneth A. Ports, Indialantic, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jan. 19, 1990, Ser. No. 467,590

Int. Cl.[5] H01L *23/48, 29/44, 29/52, 29/60*

U.S. Cl. 357—68 **12 Claims**



1. An integrated circuit architecture for supporting a plurality of field effect devices therein comprising:

a semiconductor substrate having a plurality of field effect devices in spaced apart surface portions thereof, each field effect device including source and drain regions and a gate therebetween;

a trench formed in said substrate so that said trench inter-

sects source and drain regions of said field effect devices and thereby exposes source and drain regions at sidewalls of said trench; and

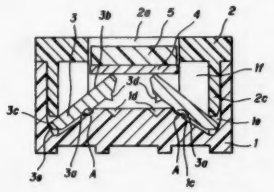
conductive material disposed in said trench in contact with the entirety of the width of source and drain regions exposed at the sidewalls of said trench.

5,070,389

IC REMOVING MECHANISM IN IC SOCKET

Matsuoka Noriyuki, Tokyo, Japan, assignor to Yamaichi Electric Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1990, Ser. No. 497,079
Claims priority, application Japan, Mar. 23, 1989, 1-72350
Int. Cl.[5] H05K *1/00*
U.S. Cl. 357—68 **1 Claim**



1. In an IC socket having a mechanism for ejecting an IC package therefrom, the socket having a socket substrate having an IC package accommodation section for receiving an IC package in an accommodating position when moved from a position outside said accommodation section into said accommodation section, and contact means for contacting terminal means of an IC package when an IC package is in the accommodating position, lever means constituted by a lever pivotally disposed within said socket substrate, said lever having a pivot means thereon and said socket substrate having a pivot means accommodating recess therein in which said pivot means is accommodated during pivoting movement of said lever, said pivot means and socket being positioned intermediate the ends of said lever, the pivoting of said lever being for pushing an IC package out of said accommodating position, said lever having a push-out lever portion and a push-in lever portion, said lever portions being movable alternately out and in around said pivot means as a fulcrum, and said push-out portion extending into said accommodation section for being pushed to an innermost position by an IC package in the accommodating position therein, and push-in means movably mounted on said socket substrate and movable from an outer position to an inner position and engaging the push-in lever portion of said lever for pushing the push-in portion in when said push-in means is pushed in to the inner position, said push-out portion of said lever being moved to an outermost position by pivoting movement of said lever in which it urges an IC package to a position outside said accommodation section, the improvement comprising:

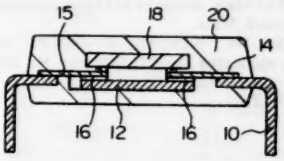
said push-out portion of said lever having a pointed projection and said socket substrate having a conical recess opposed to said pointed projection, said pointed projection and conical recess being positioned for, when said push-out portion is pushed in by the insertion of an IC package into said accommodation section, said pointed projection engag..s in said conical recess and positions said pivot means for engagement in said pivot means accommodating recess for insuring proper pivoting of said lever.

5,070,390

SEMICONDUCTOR DEVICE USING A TAPE CARRIER

Mitsuharu Shimizu, Nagano, Japan, assignor to Shinko Electric Industries Co., Ltd., Nagano, Japan

Filed May 31, 1990, Ser. No. 531,092
Claims priority, application Japan, Jun. 6, 1989, 1-143511
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—70 **5 Claims**



1. A semiconductor device using a TAB tape carrier, comprising:

a semiconductor chip having a plurality of bonding pads;

a lead frame including a plurality of leads;

a tape carrier comprising an electrically insulative flexible base film and a plurality of conductive patterns on said electrically insulative flexible base film, at least one of said conductive patterns functioning as a ground line;

said bonding pads of said semiconductor chip being electrically connected to said respective leads of said lead frame via said respective conductive patterns of said tape carrier;

a molded resin for hermetically and integrally sealing at least said semiconductor chip and said tape carrier; and

a conductive pad disposed in proximity to said conductive patterns of said tape carrier, said conductive pad being electrically connected to said at least one ground line so that a voltage of the conductive pad is at ground level; and

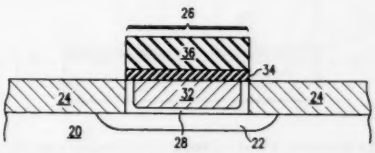
said electrically insulative flexible base film having a first surface on which said conductive patterns are formed and an opposite, second surface, and said conductive pad is in contact with said opposite, second surface of said base film.

5,070,391

SEMICONDUCTOR CONTACT VIA STRUCTURE AND METHOD

Fu-Tai Liou, Carrollton, and Charles R. Spinner, Dallas, both of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Continuation-in-part of Ser. No. 443,898, Nov. 30, 1989. This application Apr. 30, 1990, Ser. No. 516,425
Int. Cl.[5] H01L *23/48*
U.S. Cl. 357—71 **17 Claims**



1. A contact structure for integrated circuit devices, comprising:

an opening in an insulating layer, said insulating layer having an upper surface;

a plug of first metal filling said opening, said plug contacting an underlying conductive region, said plug further having an upper surface approximately co-planar with the insulating layer upper surface;

a layer of second metal covering at least a portion of the plug upper surface; and

a layer of third metal overlying said second metal layer, wherein said second and third metal layers form a signal line, and wherein said second metal layer can be etched at a different rate than said first and third metal layers.

5,070,392

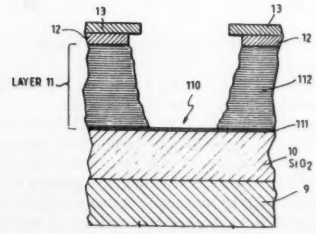
INTEGRATED CIRCUIT HAVING LASER-ALTERABLE METALLIZATION LAYER

Michael Coffey, Westboro, and Richard J. Hollingsworth, Concord, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Division of Ser. No. 170,280, Mar. 18, 1988, Pat. No. 4,849,363. This application Jan. 27, 1989, Ser. No. 303,562

Int. Cl.[5] H01L *21/268, 21/82*

U.S. Cl. 357—71 **20 Claims**



1. A laser-alterable integrated circuit device having a conductor strip extending along a face of semiconductor body, said conductor strip comprising a layered construction including a first area having a less refractory conductor material superimposed upon a more refractory material and including a second area of said conductor strip having the less refractory conductor material removed from the more refractory conductor material, said second area being open for impingement of a laser beam.

5,070,393

ALUMINUM NITRIDE SUBSTRATE FOR FORMATION OF THIN-FILM CONDUCTOR LAYER AND SEMICONDUCTOR DEVICE USING THE SUBSTRATE

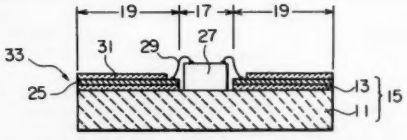
Noriko Nakagawa, Yokohama; Takaaki Yasumoto, Kawasaki, and Toshio Nakai, Tokyo, all of Japan Assignee: Kabushiki Kaisha; Toshiba Kawasaki-shi, Japan

Filed Dec. 22, 1989, Ser. No. 454,903

Claims priority, application Japan, Dec. 23, 1988, 63-325345

Int. Cl.[5] H01L *39/02*

U.S. Cl. 357—80 **9 Claims**



1. An aluminum nitride substrate for forming a semiconductor device thereon, comprising:

a ceramic substrate of sintered aluminum nitride, the surface of said ceramic substrate including a region for mounting a semiconductor element on the surface of said ceramic substrate and a region for forming a thin-film conductor layer surrounding said region for mounting said semiconductor element;

an insulating layer formed on said region for forming said thin-film conductor layer;

a thin-film conductor layer formed on said region for forming said thin-film conductor layer such that said region for forming said thin-film conductor layer is interposed between said thin-film conductor layer and said ceramic substrate and said thin-film conductor layer does not contact said ceramic substrate; and,

an exposed aluminum nitride surface of said ceramic substrate for mounting a semiconductor element.

5,070,394

IMAGE SIGNAL PROCESSING DEVICE

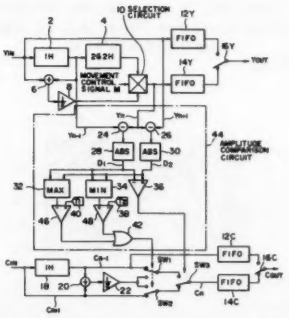
Kaoru Kobayashi, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 30, 1990, Ser. No. 501,847

Claims priority, application Japan, Mar. 31, 1989, 1-81133

Int. Cl.[5] H04N *9/535*

U.S. Cl. 358—11 **8 Claims**



1. A television signal processing device for converting an interlaced scanning television signal to a progressive scanning television signal, which comprises:

Luminance signal output means for alternately outputting an interlaced scanning actual line luminance signal and an interpolation line luminance signal for making an interpolation between interlaced scanning actual lines on the basis of an actual line luminance signal of an inputted interlaced scanning television signal;

color signal output means for alternately outputting an interlaced scanning actual line color signal and an interpolation line color signal for making an interpolation between interlaced scanning actual lines on the basis of an actual color signal of said inputted interlaced scanning television signal; and

control means for controlling said color signal output means;

said color signal output means including interpolation output changeover switch which is switched to one of first, second and third positions in response to an output from said control means, and outputting an average value signal of color signals of a pair of adjacent interlaced scanning actual lines at said first position, a color signal of an actual line preceding said interpolation line by one line at said second position, and a color signal of an actual line succeeding said interpolation line by one line at said third position,

said control means having a first correlation detector which detects a first correlation between said interpolation line luminance signal and a luminance signal of an actual line preceding said interpolation line by one line, and a second correlation detector which detects a second correlation between said interpolation line luminance signal and a luminance signal of an actual line succeeding said interpolation line by one line, and controlling said changeover switch so that, when both the first and second correlations are lower than a first predetermined value or higher than a second predetermined value, said changeover switch is located at said first position; and that when at least one of the first and the second correlation falls within the range

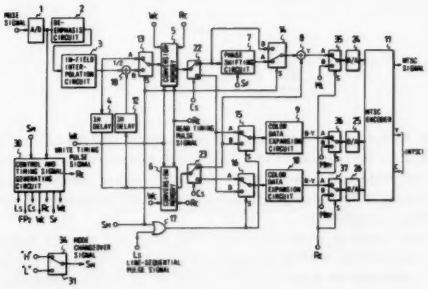
from said first predetermined value to said second predetermined value, said changeover switch is located at said second position or at said third position dependent on whether said first correlation is higher than or lower than said second correlation, respectively.

5,070,395

TELEVISION SIGNAL SYSTEM CONVERSION APPARATUS

Masahiro Kitaura, Nagareyama, and Tomoaki Uchida, Noda, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Mar. 30, 1990, Ser. No. 501,754
Claims priority, application Japan, Mar. 31, 1989, 1-81132
Int. Cl.[5] H04N *7/01, 11/20*
U.S. Cl. 358—11 **3 Claims**



1. An apparatus for executing conversion processing of a MUSE (Multiple Sub-Nyquist Sampling Encoding) video signal to obtain a converted NTSC (National Television Systems Committee) video signal, comprising:

selector means actuatable for establishing a first mode and a second mode of operation of said apparatus;

means for executing said conversion processing in said first mode, comprising means for removing fixed-size portions of each scan line of said MUSE signal corresponding to left and right sides of a video picture represented by said MUSE signal and means for thinning out the resulting scan lines of said MUSE signal by a factor of ½ to thereby derive from each frame of said MUSE signal all of the scan lines of a corresponding frame of said converted NTSC signal, whereby said NTSC signal represents said MUSE signal picture with said left and right portions removed and having an NTSC aspect ratio of 4:3; and

means for executing said conversion processing in said second mode, comprising means for thinning out the scan lines of said MUSE signal by a factor of ⅓ to thereby obtain from the scan lines of each frame of said NTSC signal a fixed number of the scan lines of a corresponding frame of said converted NTSC signal, and means for generating the remaining scan lines of said corresponding frame by utilizing masking signals, whereby said NTSC signal represents a picture having said NTSC aspect ratio, said picture being formed of said MUSE signal picture having an aspect ratio of 16:9 sandwiched between upper and lower mask regions.

5,070,396

COMPATIBLE WIDESCREEN TELEVISION SYSTEM

Michael A. Isnardi, Plainsboro, and Jack S. Fuhrer, Princeton Junction, both of N.J., assignors to General Electric Company, Princeton, N.J.

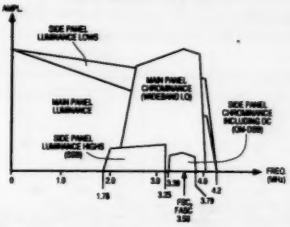
Filed Nov. 6, 1989, Ser. No. 435,227
Int. Cl.[5] H04N *11/06*
U.S. Cl. 358—12 **24 Claims**

1. In a system for processing a widescreen television-type signal containing main panel information and side panel information, apparatus comprising:

means for processing said main panel information;

means for providing an auxiliary subcarrier signal other than a standard chrominance subcarrier signal;

means for modulating said auxiliary subcarrier with side panel chrominance information to form a double sideband



modulated auxiliary subcarrier with respect to said side panel chrominance information; and

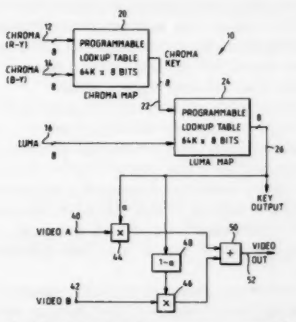
means for modulating said auxiliary subcarrier with side panel high frequency luminance information exclusive of DC information to form a single sideband modulated auxiliary subcarrier with respect to said side panel high frequency luminance information.

5,070,397

KEYING METHODS FOR DIGITAL VIDEO

Thomas Wedderburn-Bisshop, Zetland, Australia, assignor to Rank Cintel Limited, England

Filed Apr. 9, 1991, Ser. No. 682,551
Claims priority, application Australia, Apr. 11, 1990, PJ9585; Jul. 3, 1990, PK0988; United Kingdom, Mar. 1, 1991, 9104320
Int. Cl.[5] H04N *9/75*
U.S. Cl. 358—22 **2 Claims**

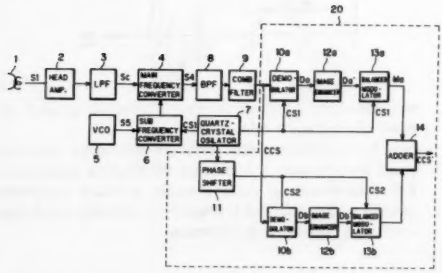


1. A digital video key signal generator, comprising: first and second chroma inputs for receiving first and second chroma digital signals, a first programmable lookup table device coupled to the first and second chroma inputs to be addressed by the first and second chroma signals and to output a chroma key signal in response thereto, a luma input for receiving a luma digital signal, and a second programmable lookup table device coupled to the luma input and to the output of the first programmable lookup table device to be addressed by the luma signal and the chroma key signal and to output an output key signal in response thereto.

5,070,398
CONTOUR COMPENSATOR FOR CARRIER CHROMINANCE SIGNAL

Junji Suzuki, and Tsutomu Kawano, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 363,774, Jun. 9, 1989, abandoned. This application Apr. 19, 1991, Ser. No. 687,092
Claims priority, application Japan, Nov. 15, 1988, 63-289281
Int. Cl.[5] H04N *9/68*
U.S. Cl. 358—37 **4 Claims**



1. A contour compensator for a carrier chrominance signal for generating a second carrier chrominance signal by contour-enhancing a first carrier chrominance signal, said contour compensator comprising:

reference subcarrier generating means for generating a first reference subcarrier and a second reference subcarrier being out of phase with said first reference subcarrier by an angle other than 90° and 180°;

carrier chrominance signal generating means for generating said first carrier chrominance signal;

a first demodulator connected to said reference subcarrier generating means and said carrier chrominance signal generating means for demodulating said first carrier chrominance signal through said first reference subcarrier to output a first demodulated signal;

a second demodulator connected to said reference subcarrier generating means and said carrier chrominance signal generating means for demodulating said first carrier chrominance signal through said second reference subcarrier to output a second demodulated signal;

a first contour enhancer connected to said first demodulator for detecting abrupt waveform portions of said first demodulated signal and enhancing abruptness thereof, thereby to output a first contour-enhanced signal;

a second contour enhancer connected to said second demodulator for detecting abrupt waveform portions of said second demodulated signal and enhancing abruptness thereof, thereby to output a second contour-enhanced signal;

a first modulator connected to said reference subcarrier generating means and said first contour enhancer for modulating said first reference subcarrier through said first contour-enhanced signal to output a first modulated signal;

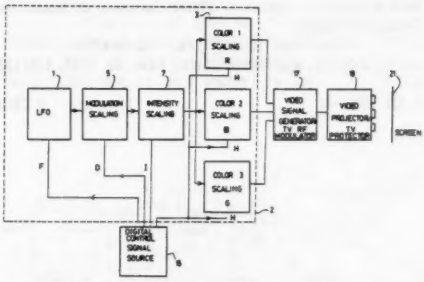
a second modulator connected to said reference subcarrier generating means and said second contour enhancer for modulating said second reference subcarrier through said second contour-enhanced signal to output a second modulated signal; and

an adder connected to said first and second modulators for composing said first and second modulated signals to generate said second carrier chrominance signal.

5,070,399
LIGHT COLOR AND INTENSITY MODULATION SYSTEM

Alain Martel, P.O. Box 2412, Ste-Adele, Province of Quebec, Canada J0R 1L0

Continuation-in-part of Ser. No. 473,470, Feb. 1, 1990, abandoned. This application Dec. 21, 1990, Ser. No. 631,489
Int. Cl.[5] H04N *1/46*
U.S. Cl. 358—81 **12 Claims**



1. A light color and intensity modulation system having an output to be connected to a color light projector and an input to receive a hue control signal and an intensity control signal including at least one modulation frequency component F, said system comprising:

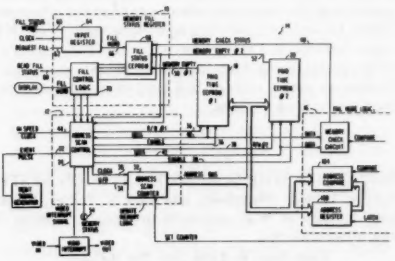
color scaling means for receiving said hue control signal, said color scaling means producing a plurality of color component signals, said plurality of color component signals being supplied as said output to said color light projector; and

intensity control means for receiving said intensity control signal, said intensity control means comprising a low frequency oscillator whose output is an intensity modulation signal for varying an intensity of said plurality of color component signals between a preset minimum and a preset maximum value, said low frequency oscillator having a frequency responsive to said at least one modulation frequency component F of said intensity control signal, said plurality of color component signals for controlling said projector.

5,070,400
PAY-TV TIME PURCHASE SCHEME

Daniel Lieberman, Gaithersburg, Md., assignor to Comsat, Washington, D.C.

Continuation of Ser. No. 67,852, Jun. 30, 1987, abandoned. This application Jan. 19, 1989, Ser. No. 300,701
Int. Cl.[5] H04N *7/10*
U.S. Cl. 358—84 **15 Claims**



2. In a subscriber television system wherein multiple programs are transmitted from a central station to a plurality of subscribers at respective subscriber stations:

storage means at each subscriber station for storing an amount of data representing viewing credit, with the viewing credit corresponding to the number of memory locations at which the data are stored;

means for generating a debit signal in accordance with a fee associated with a program currently being viewed by a subscriber at each said subscriber station; and

means for decreasing the amount of said stored data in accordance with said debit signal.

5,070,401

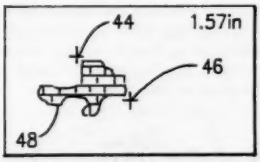
VIDEO MEASUREMENT SYSTEM WITH AUTOMATIC CALIBRATION AND DISTORTION CORRECTION

Jon R. Salvati, Skaneateles, and Raymond A. Lia, Auburn, both of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Apr. 9, 1990, Ser. No. 506,175

Int. Cl.[5] A61B *1/04*; H04N *7/18*

U.S. Cl. 358—107 **20 Claims**



1. In a borescope having an elongated insertion tube for viewing inaccessible objects and a video image pickup in the distal end thereof for producing a video image for viewing on a video display the method of measuring the size of the object being viewed by determining the location of a known supplementary image relative to said object being viewed, including the steps of:

projecting a known supplementary images into the object to be measured;

detecting said supplementary and object images;

displaying said detected supplementary and object images on a video display;

electronically counting the number of pixels in the video display screen between an initial point and the supplementary image location to determine object distance;

electronically counting the number of pixels in the video display between a first and second location on the object to be measured;

applying pixel by pixel calibration and distortion correction factors to the pixel counting steps;

calculating and displaying on a video display the actual dimension represented by the number of pixels counted in the counting steps corrected for calibration, distortion and object distance.

5,070,402

ENCODING IMAGE INFORMATION TRANSMISSION APPARATUS

Yoshiki Ishii, Yokohama; Makoto Shimokoriyama, Kawasaki; Tetsuya Shimizu, Yokoham; Katsuji Yoshimura, Hemamatsu; Akio Fujii, and Tomohiko Sasatani, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 273,249, Nov. 18, 1988, abandoned. This application Apr. 10, 1991, Ser. No. 683,499

Claims priority, application Japan, Nov. 27, 1987, 62-267405; Nov. 27, 1987, 62-297404; Nov. 27, 1987, 62-297409; Nov. 27, 1987, 62-297410

Int. Cl.[5] H04N *7/12*

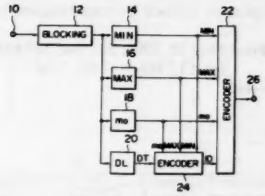
U.S. Cl. 358—135 **18 Claims**

1. An image information transmission apparatus for encoding an image information signal and transmitting an encoded image information signal, said information transmission apparatus comprising:

(A) blocking means for receiving an image information signal of one frame consisting of a plurality of pixel data and for dividing the image information signal into a plurality of blocks each consisting of a predetermined number of pixel data;

(B) first data forming means for forming at least two reference value data associated with a dynamic range of levels of the pixel data constituting each of the blocks divided by said blocking means;

(C) second data forming means for forming distribution state data associated with a distribution state of the levels of the



pixel data constituting each of the blocks divided by said blocking means;

(D) encoding means for encoding the pixel data constituting each block to form encoded data on the basis of the refernece value data formed by said first data forming means and the distribution state data formed by said second data forming means; and

(E) transmission data series forming means for forming a transmission data series by using the reference value data formed by said first data forming means, the distribution state data formed by said second data forming means, and the encoded data encoded by said encoding means as transmission units.

5,070,403

VIDEO SIGNAL INTERPOLATION

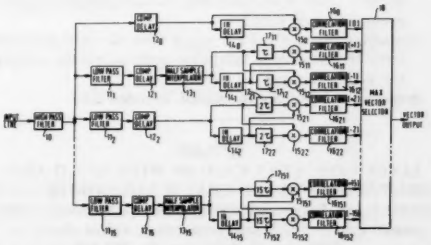
James H. Wilkinson, Basingstoke, United Kingdom, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 10, 1990, Ser. No. 506,809

Claims priority, application United Kingdom, Apr. 21, 1989, 8909143; Apr. 21, 1989, 8909144

Int. Cl.[5] H04N *7/12, 7/01, 11/20*

U.S. Cl. 358—136 **20 Claims**



1. A method of deriving gradient vectors for use in the spatial interpolation of an input digital video signal which represents fields of pixels arranged in horizontal scan lines, said method comprising the steps of:

high pass filtering the scan lines of a field of said input digital video signal so as to provide a high pass filtered video signal;

supplying said high pass filtered video signal to a plurality of channels and, in at least some of said channels, differently

low pass filtering the high pass filtered video so as to form respective low pass filtered video signals;

determining pixel by pixel of the video signal output from each of said channels the correlation for a range of pixel offsets, thereby forming a plurality of gradient vectors for each pixel of said input digital video signal; and

selecting for each pixel of said input digital video signal the one of said gradient vectors corresponding to the correlation which is of maximum value.

5,070,404

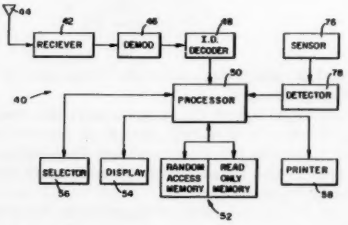
METHOD AND APPARATUS FOR CONTEMPORANEOUS DELIVERY OF DATA

Wayne J. Bullock, Paoli, Pa., and H. Edward Gordon, Palmdale, Calif., assignors to Bullock Communications, Inc., Malvern, Pa.

Filed May 15, 1990, Ser. No. 523,623

Int. Cl.[5] H04N *7/08, 7/04*

U.S. Cl. 358—142 **9 Claims**



1. A method for contemporaneous delivery of data from a first location to a user at a remote location utilizing standard broadcast facilities, the method comprising:

encoding the data and an identifier uniquely associated with the data into a data packet;

transmitting the data packet along with a first standard broadcast signal;

generating an enabling cue signal corresponding to the identifier;

encoding the cue signal and transmitting the encoded cue signal along with a second standard broadcast signal;

receiving and demodulating the first broadcast signal at the user location and decoding the identifier portion of the data packet;

storing the received encoded data in a memory uniquely associated with the decoded identifier at the user location;

receiving and demodulating the second broadcast signal at the user location and decoding the demodulated signal to provide the cue signal;

comparing the received cue signal with the received identifier and providing an indication to the user if the comparison is positive; and

decoding and printing the stored, encoded data.

5,070,405

ELECTRONIC STILL CAMERA WITH MULTI-AREA LIGHT METERING AND GRAY SCALE MODIFICATION

Satoshi Ejima, Tokyo, and Masahiro Suzuki, Yokohama, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Filed Sep. 13, 1990, Ser. No. 581,879

Claims priority, application Japan, Sep. 19, 1989, 1-242507; Sep. 19, 1989, 1-242508

Int. Cl.[5] H04N *5/30*

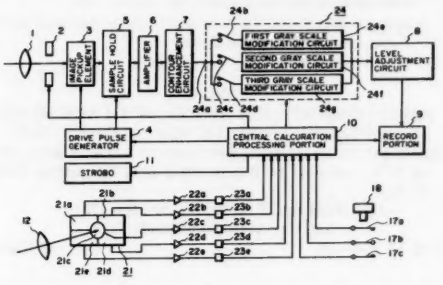
U.S. Cl. 358—209 **2 Claims**

1. An electronic still camera including:

light metering means for light-metering a plurality of portions of an object to be photographed and outputting a plurality of signals corresponding to the quantities of light of said portions;

image pickup means for converting the image of the object to be photographed into an image signal;

gray scale modification means provided with a plurality of selectable gray scale modification characteristics and modifying the gray scale of said image signal; and



selecting means for effecting calculation on the basis of the outputs from said light metering means and selecting one of said plurality of gray scale modification characteristics provided in said gray scale modification means on the basis of the result of said calculation.

5,070,406

IMAGE SENSING APPARATUS HAVING A LOW-RESOLUTION MONITOR, MEANS FOR REDUCING THE AMOUNT OF INFORMATION IN AN IMAGE SIGNAL, AND SWITCHING MEANS FOR REDUCING POWER CONSUMPTION IN VARIOUS OPERATING MODES

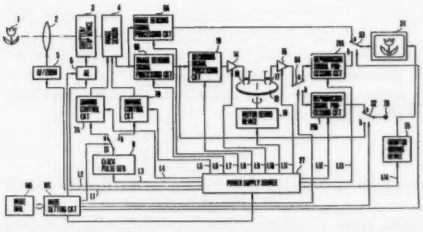
Takao Kinoshita, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 390,431, Aug. 3, 1989, Pat. No. 4,928,137, which is a continuation of Ser. No. 134,179, Dec. 17, 1987, abandoned, which is a division of Ser. No. 682,936, Dec. 18, 1984, Pat. No. 4,740,828. This application Mar. 7, 1990, Ser. No. 490,147

Claims priority, application Japan, Dec. 24, 1983, 58-245847; Dec. 24, 1983, 58-245848; Dec. 28, 1983, 58-251736; Dec. 28, 1983, 58-251737

Int. Cl.[5] H04N *5/30, 9/07, 5/225*

U.S. Cl. 358—224 **14 Claims**



1. An image monitor-displaying apparatus, comprising:

image sensing means for sensing an image of an object and for generating an image signal corresponding to said object;

output control means for outputting the image signal from said large sensing means on the basis of either a first output mode in which the image signal having a first resolution is outputted from said image sensing means or a second output mode in which the image signal having a second resolution lower than said first resolution is outputted from said image sensing means;

monitor-displaying means for displaying the image signal

outputted from said image sensing means on the basis of said second output mode; and

displaying operation control means for giving an instruction to said output control means to effect an operation based on said first output mode without effecting a display by said monitor-displaying means, and for giving an instruction to said output control means to effect an operation based on said second output mode so as to output an image signal to produce the above-mentioned second resolution, while effecting a display by said monitor-displaying means.

5,070,407

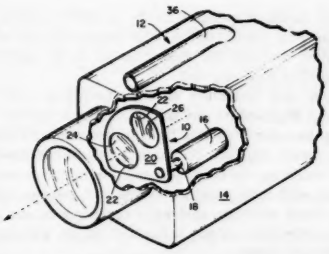
FILTER CHANGING MECHANISM FOR A VIDEO CAMERA

Ernest E. Wheeler; William M. Wheeler; David C. Wheeler, all of 5358 Caminito Velasquez, San Diego, Calif. 92124, and Thomas D. Henderson, 50 Rockwood, Irvine, Calif. 92714

Filed May 11, 1990, Ser. No. 522,092

Int. Cl.[5] G02B *13/16*; H04N *5/225*

U.S. Cl. 358—225 **14 Claims**



1. An automatic filter control system for a video camera having an image sensing element comprising:

a linear translating filter lens carrier;

at least two different light frequency filters carried by said filter lens carrier; and

filter lens carrier transfer mechanism for automatically transferring said filter lens carrier depending on the frequency of illumination viewed by said image sensing element for positioning only a selected one of said at least two different light frequency filters carried thereby in front of said image sensing element.

5,070,408

FOCUSING APPARATUS AND DIGITAL FILTERS FOR USE THEREWITH

Akihiro Kikuchi, Chiba, and Tokuya Fukuda, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 15, 1990, Ser. No. 523,568

Claims priority, application Japan, May 19, 1989, 1-127560; May 29, 1989, 1-135351

Int. Cl.[5] H04N *5/232*

U.S. Cl. 358—227 **17 Claims**

1. A focusing control apparatus for a video camera in which middle high frequency components in a video signal are maximized and are detected for focusing, comprising:

lens means for focusing an image;

motive means for moving said lens means;

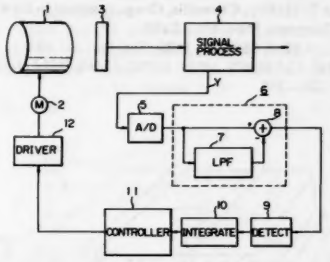
image pickup means for converting light from said lens means into electrical signals;

signal processing means for processing the electrical signals from said image pickup means to obtain an analog luminance signal;

analog to digital converter means for converting the analog luminance signal from said signal processing means into a digital luminance signal;

filter means including a low pass filter having a transfer characteristic approximating that of said lens means when the latter is out of focus and to which said digital luminance signal is supplied, and subtracting means for subtracting signal components which pass through said low pass filter from said digital luminance signal so as to produce a filtered output signal;

detecting means for detecting the level of said filtered output signal and providing a corresponding detected output signal;



integrating means for integrating said detected output signal and providing an integrated output signal;

driving means for driving said motive means in accordance with a control signal; and

control means responsive to said integrated output signal for providing said control signal to said driving means such that said lens means is positioned to maximize said integrated output signal.

5,070,409

LIQUID CRYSTAL DISPLAY DEVICE WITH DISPLAY HOLDING DEVICE

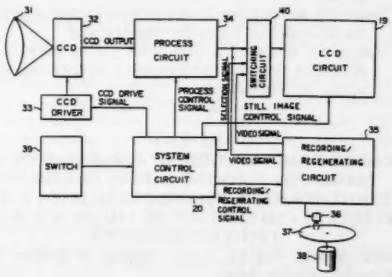
Shunichi Miyadera, Tokyo, and Harumi Aoki, Saitama, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1990, Ser. No. 536,779

Claims priority, application Japan, Jun. 13, 1989, 1-151006

Int. Cl.[5] H04N *3/14*, *5/70*

U.S. Cl. 358—241 **12 Claims**



1. A liquid crystal display device for receiving video signal and displaying a visual image, comprising:

an active matrix liquid crystal display member having a plurality of display elements and a plurality of switching elements:

means for supplying, based upon said video signal, a drive signal to said display elements through respective ones of said switching elements;

control means for keeping said switching elements in an OFF condition for a predetermined period of time so that the supply of said drive signal to said display elements is interrupted, whereby a still image is displayed for said

predetermined period of time without the need to apply another video signal to said display member.

5,070,410

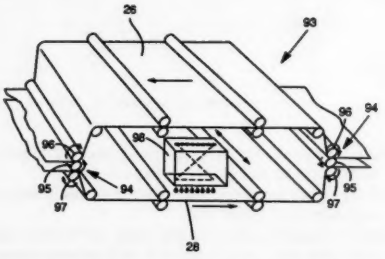
APPARATUS AND METHOD USING A COMBINED READ/WRITE HEAD FOR PROCESSING AND STORING READ SIGNALS AND FOR PROVIDING FIRING SIGNALS TO THERMALLY ACTUATED INK EJECTION ELEMENTS

LeMoyne F. Hadley, Corwallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 21, 1989, Ser. No. 327,481

Int. Cl.[5] H04N *1/034;* **G01D** *15/16;* **B41J** *2/05*

U.S. Cl. 358—296 **6 Claims**



1. A reproducing apparatus, comprising a semiconductor substrate;

a photodetector fabricated on the substrate;

an ink droplet ejector including:

a heating element fabricated on the substrate; and

means defining an ink chamber containing the heating element, the chamber including an orifice through which ink in the chamber can be ejected upon the heating of the heating element by electrical firing signals; and

processing means coupled to the detector for processing and storing output signals produced by the photodetector and for providing to the heating element electrical firing signals corresponding to the stored output signals, the processor means including:

a semiconductor read/write memory fabricated the substrate;

means for writing data corresponding to output signals of the photodetector into the memory; and

means for reading the data from the memory and for providing electrical firing signals corresponding thereto to the heating element.

5,070,411

COLOR IMAGE RECORDING APPARATUS USING MASKS FOR FORMING LATENT IMAGES ON PHOTOSENSITIVE RECORDING MEDIUM WITH DETECTION AND CONTROL OF COLOR-SEPARATED LIGHT COMPONENTS

Makoto Suzuki, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Japan

Filed Sep. 19, 1990, Ser. No. 584,657

Claims priority, application Japan, Sep. 19, 1989, 1-243194; Nov. 28, 1989, 1-308300

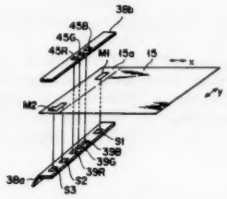
Int. Cl.[5] H04N *1/23, 1/46;* **G03B** *27/10, 27/73*

U.S. Cl. 358—302 **14 Claims**

1. An image recording apparatus for recording an image of an original document on a sheet of paper using a photosensitive recording medium and a plurality of mask members, each of the plurality of mask members having a light shielding image corresponding to a color-separated image of the original document and a non-image region disposed at one end of each mask member, comprising:

exposure means for exposing the photosensitive recording medium to light to form a latent image thereon, wherein the mask member is superposed on the photosensitive recording medium for exposing the photosensitive recording medium to a color-separated light component corresponding to the color-separated image formed on the mask member through the mask member;

detecting means for detecting a transmission rate of the color-separated light component transmitting through the mask member and producing a detection output, said detecting means being positioned at a position corresponding to the non-image region of each mask member;



control means responsive to the detection output for controlling an amount of the color-separated light component applied through the mask member to the photosensitive recording medium; and

wherein said detection means comprises light emitting means disposed on one side of the mask member for emitting the color-separated light component, and light receiving means disposed on another side of the mask member for receiving the color-separated light component emitted from said light emitting means and transmitted through the mask member, said light receiving means producing the detection output indicative to an amount of light received thereat.

5,070,412

APPARATUS FOR GENERATING AN ENLARGEMENT/REDUCTION SIGNAL

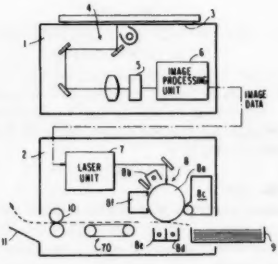
Hidechika Kumamoto, Sakai, and Tsukasa Matsushita, Daito, both of Japan, assignors to Mita Indusatrial Co., Ltd., Japan

Filed Nov. 27, 1989, Ser. No. 441,255

Claims priority, application Japan, Nov. 29, 1988, 63-302749

Int. Cl.[5] H04N *1/40*

U.S. Cl. 358—451 **13 Claims**



1. An enlargement/reduction signal generating apparatus for generating reading clock pulses and writing clock pulses to enlarge/reduce digital data stored in a storing means, said apparatus comprising:

basic clock pulse generating means for generating basic clock pulses;

frequency-divided clock pulse generating means for generating different frequency-divided clock pulses comprising different frequencies by dividing the frequency of said basic clock pulses;

selection signal generating means for generating a selection

signal to combine said clock pulses generated by said basic clock pulse generating means and said frequency-divided clock pulse generating means, whereby a ratio of said reading clock pulses to said writing clock pulses corresponds to a predetermined enlargement,

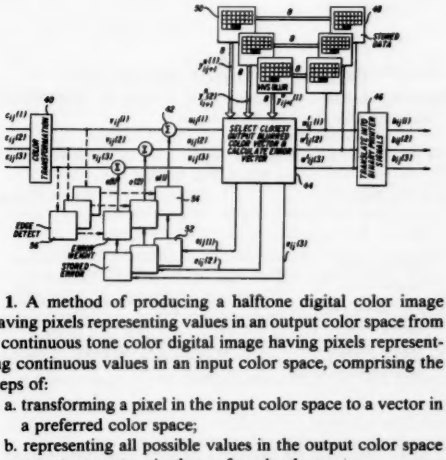
said selection signal generating means comprising clock selection signal output means for outputting a clock selection signal to select clocks to be combined from said basic clock and said frequency-divided clocks, and timing signal output means for outputting a signal to fix the timing for combining the clocks selected by said clock selection signal,

said clock selection signal output means comprising first data latch means for latching code data to select a base clock, second data latch means for latching code data to select a first combined clock to be combined with said base clock, third data latch means for latching code data to select a second combined clock to be combined with said base clock, and control means for selecting code data from the code data of said first, second and third data latch means and outputting the selected data, corresponding to said timing signal of said timing signal output means, and enlargement/reduction clock-pulse generating means for generating enlargement/reduction clock pulses by combining said basic clock pulses and said frequency-divided clock pulses in correspondence with said selection signal from said selection signal generating means and for outputting said enlargement/reduction clock pulses as said reading clock pulses or said writing clock pulses.

5,070,413
COLOR DIGITAL HALFTONING WITH VECTOR ERROR DIFFUSION

James R. Sullivan; Rodney L. Miller, and Thomas J. Wetzel, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 10, 1989, Ser. No. 419,559
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—456 **5 Claims**



1. A method of producing a halftone digital color image having pixels representing values in an output color space from a continuous tone color digital image having pixels representing continuous values in an input color space, comprising the steps of:

a. transforming a pixel in the input color space to a vector in a preferred color space;

b. representing all possible values in the output color space as output vectors in the preferred color space;

c. selecting and output vector in the preferred color space that is closest to the transformed input pixel;

d. calculating an error vector in the preferred color space as the distance between the transformed input pixel and the selected output vector;

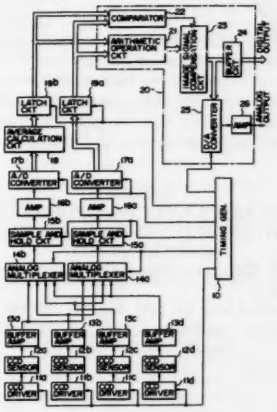
e. distributing by weighted addition the calculated error vector to a neighborhood of adjacent input pixels to be processed; and

f. translating the selected output vector to a pixel in the output color space.

5,070,414
METHOD AND APPARATUS FOR READING IMAGE INFORMATION FORMED ON MATERIAL

Teruo Tsutsumi, Tama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 15, 1989, Ser. No. 393,951
Claims priority, application Japan, Sep. 20, 1988, 63-235307; Dec. 27, 1988, 63-329751; Apr. 26, 1989, 1-106851
Int. Cl.[5] H04N *1/40*
U.S. Cl. 358—466 **17 Claims**



1. An image reader comprising:

a line sensor comprising a one-dimensional array of a plurality of photoelectric conversion elements, said plurality of photoelectric conversion elements being selectively shaded to provide light-shielded pixels for outputting light-shielded signals and effective pixels which are not shaded for outputting effective pixel signals;

analog to digital conversion means for converting the light-shielded signals to digital light-shielded signals;

holding means for holding the digital light-shielded signals; and

image signal producing means for correcting a first signal corresponding to the effective pixel signals in accordance with a second signal corresponding to the digital light-shielded signals held by said holding means, and generating an image signal.

5,070,415
IMAGE READING APPARATUS HAVING A LOW FRICTION MEMBER BETWEEN THE CONVEYING ROLLER AND THE TRANSPARENT PLATE

Hiroaki Matsumoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

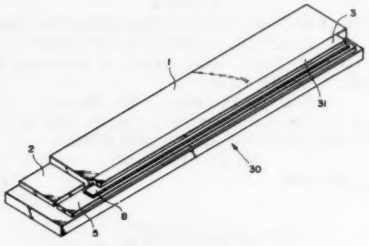
Continuation of Ser. No. 217,436, Jul. 11, 1988, abandoned. This application Mar. 28, 1990, Ser. No. 501,352
Claims priority, application Japan, Jul. 14, 1987, 62-108805[U]
Int. Cl.[5] H04N *1/04*
U.S. Cl. 353—482 **53 Claims**

1. An apparatus for reading an image on a sheet, comprising:

conveying means for conveying the sheet;

a transparent member having a surface for contacting said conveying means and a surface of the sheet conveyed by said conveying means;

a photoelectric conversion element disposed in said transparent member or on a surface of said transparent member opposite to said surface which contacts the surface of the sheet; and



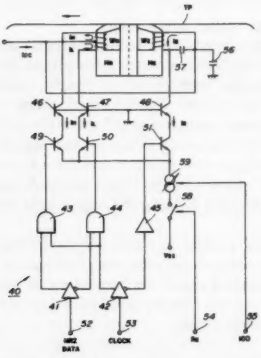
a low friction portion formed on at least a portion of said surface of said transparent member which contacts said conveying means, said low friction portion being disposed at a location upstream of an area on said transparent member at which reading of the image is effected with respect to a direction of conveyance of the sheet.

5,070,416

ERASING PREVIOUSLY RECORDED SIGNAL IN APPARATUS FOR PULSE TRAIN RECORDING OF DIGITAL SIGNAL

Takeo Eguchi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 30, 1989, Ser. No. 358,958
Claims priority, application Japan, May 31, 1988, 63-133922
Int. Cl.[5] G11B *5/03, 5/02*
U.S. Cl. 360—66 **11 Claims**



1. A digital signal recording apparatus for pulse train recording of an input digital signal on a recording medium guided by a rotary drum, said apparatus comprising:

an input terminal receiving said input digital signal;

recording head means mounted on said rotary drum for relative movement in respect to said recording medium;

erasing head means mounted on said rotary drum adjacent to said recording head means at a location preceding said recording head means considered in the direction of said relative movement;

a clock signal source for providing a clock signal having a predetermined period;

means responsive to said input digital signal and said clock signal for applying to said recording head means a recording current which takes one of first or second levels during a first portion of each said period of the clock signal and which returns to a reference level during a second portion of each said period for effecting said pulse train recording; and

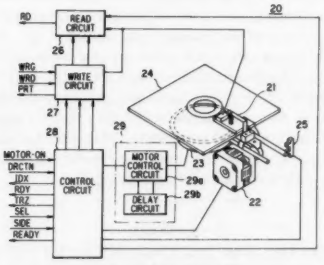
control means for controlling said erasing head means during said second portion of each said period of the clock signal when said recording current is at said reference level such that an erasing current then flows in said erasing head means for erasing a previously recorded signal before said pulse train recording.

5,070,417

DISC DRIVE UNIT AND METHOD AND SYSTEM FOR CONTROLLING THE SAME

Asayoshi Kawashita, Chigasaki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 21, 1989, Ser. No. 439,804
Claims priority, application Japan, Nov. 22, 1988, 63-295295
Int. Cl.[5] G11B *15/18, 19/00*
U.S. Cl. 360—71 **17 Claims**



1. A method of controlling rotational movement of a disc by means of a disc drive mechanism, which comprises the steps of:

sending a command for disc rotation to the disc drive mechanism in response to a 'drive-ON' signal received;

starting a timing operation in response to a 'drive-OFF' signal received; and

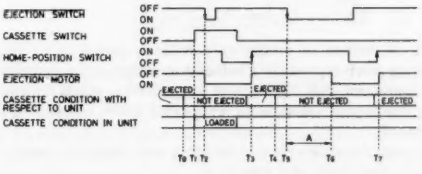
sending a command for stoppage of disc rotation to the disc drive mechanism if there is no further 'drive-ON' signal received within a predetermined time interval of the timing operation.

5,070,418

CASSETTE EJECTION APPARATUS

Kazushi Takahashi, Chichibu, Japan, assignor to Canon Denshi Kabushiki Kaisha, Chichibu, Japan

Filed Apr. 9, 1990, Ser. No. 506,256
Claims priority, application Japan, Apr. 13, 1989, 1-91830
Int. Cl.[5] G11B *17/04*
U.S. Cl. 360—71 **10 Claims**



1. An apparatus for ejecting a cassette containing therein a recording/reproducing medium from a disk unit comprising:

driving means for producing a predetermined driving force for ejecting said cassette;

command means for commanding ejection of said cassette;

detection means for detecting a loaded condition of said cassette;

ejection control means for causing said driving means to

carry out a cassette ejection operation in response to an ejection command from said command means when the cassette loaded condition is indicated by an output of said detection means; and

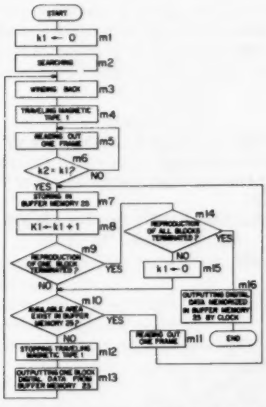
emergency ejection control means for causing said driving means to execute the cassette ejection opeation in the case that the ejection command from said command means continues in excess of a predetermined time period regardless of the output of said detection means.

5,070,419

METHOD AND APPARATUS FOR RECORDING AND REPRODUCING OF A RECORDING MEDIUM

Chitoku Kiyonaga, Higashi-Hiroshima, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 4, 1989, Ser. No. 417,200
Claims priority, application Japan, Oct. 7, 1988, 63-254383
Int. Cl.[5] G11B *15/18*
U.S. Cl. 360—72.2 7 Claims



1. An apparatus for recording and reproducing using a recording medium comprising:

a recording medium having recording areas in which digital data is recorded in predetermined recording units;

generating means for generating digital data divided into at least one information unit having a variable amount of data associated therewith;

means for separating digital data of a same information unit when an amount of data in an information unit exceeds a capacity of a recording unit and for recording the digital data in the recording medium with discrimination information on a recording unit basis;

reproducing means for reproducing digital data from the recording medium on a recording unit basis;

memory means for storing the reproduced digital data and having a capacity exceeding a capacity of one information unit; and

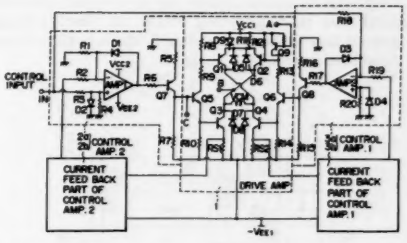
control means for storing discrimination information of the recording unit to be reproduced next when a reproducing operation is discontinued in response to an output from said reproducing means, for controlling said reproducing means to re-start at the recording unit to be reproduced next in accordance with the stored discrimination information, and for controlling said memory means to output the digital data stored therein to said generating means on an information unit basis.

5,070,420

MAGNETIC DISK DRIVE

Tohru Shinohara, Kawasaki, and Hiroshi Tsurumi, Inagi, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 30, 1989, Ser. No. 443,367
Claims priority, application Japan, Nov. 30, 1988, 63-303009
Int. Cl.[5] G11B *5/54*
U.S. Cl. 360—75 7 Claims


CONTROL INPUT
CONTROL AMP. 2
CONTROL AMP. 1
CURRENT FEED BACK PART OF CONTROL AMP. 2
CURRENT FEED BACK PART OF CONTROL AMP. 1
DRIVE AMP.

1. A magnetic disk drive comprising:

a rotating magnetic disk;

a carrier for supporting a magnetic head for reading or writing data on said disk;

a motor, operatively connected to said carrier, for moving said carrier;

a drive circuit, operatively connected to said motor, for driving said motor; and

a control circuit, operatively connected to said drive circuit, for applying a control signal and an adhesion release signal to said drive circuit;

said drive circuit including:

a bridge circuit, operatively connected to said motor, and having first and second ends, four transistors for driving a coil of said motor, said coil having two ends, one pair of opposite junctions of said four transistors being connected to first and second power sources respectively, and the order pair of opposite junctions of said four transistors being connected to said first and second ends of said coil;

a pair of control amplifiers, operatively connected to said bridge circuit, for controlling said bridge circuit to drive said coil in a positive or negative direction in accordance with a control input signal from said control circuit, said pair of control amplifiers turning ON one pair of opposing transistor at the same time; and

an adhesion control circuit, operatively connected to said bridge circuit, for controlling said bridge circuit to drive said coil in one direction in accordance with an adhesion release command from said control circuit before said disk begins to rotate, said adhesion control circuit turning ON only one of said four transistor connected to said first end of said coil and connecting said second end of said coil to a medium level point between said first and second power sources.

5,070,421

MAGNETIC DISK SYSTEM HAVING TRACKING CONTROL USING RECORDED INFORMATION

Kazuhiko Sumiya, and Hajime Sugino, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 593,463, Oct. 3, 1990, abandoned, which is a continuation of Ser. No. 248,447, Sep. 23, 1988, abandoned. This application May 6, 1991, Ser. No. 698,189
Claims priority, application Japan, Sep. 25, 1987, 62-23891; Sep. 25, 1987, 62-238915; Oct. 7, 1987, 62-251585; Feb. 3, 1988, 63-21874
Int. Cl.[5] G11B *5/596*
U.S. Cl. 360—77.07 7 Claims

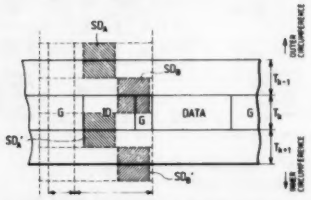
1. A magnetic storage system comprising

a magnetic head assembly;

a magnetic storage disk having a plurality of concentric

tracks, each of said tracks including a plurality of sectors, each sector including a general data field for storing general data, a sector identification data (ID) field for storing sector identification data and a servo-information field for storing servo information, said general data field and said ID field being provided in a shallow portion of said disk, said servo-information field being provided in a deep portion of said disk, said ID field overlying at least in part said servo-information field, said general data field being longitudinally separated from said servo-information field;

general data reading/writing means for reading/writing general data in the general data fields through said magnetic head assembly;



servo-information writing means for writing servo information for tracking control in the servo-information fields of the disk through said magnetic head assembly, said servo information being written in the servo-information fields longitudinally separated from said general data fields;

servo-information reading means for reading the written servo information through said magnetic head assembly;

means for reading through said magnetic head assembly the sector identification data in the ID fields; and

tracking control means for controlling the position of the magnetic head assembly relative to a desired one of the tracks on the disk using the servo information read by said servo information reading means through said magnetic head assembly.

5,070,422

MAGNETIC TAPE BACK TENSION DEVICE FOR MAGNETIC RECORDING-REPRODUCTION SYSTEM

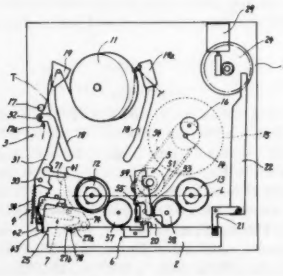
Yoshikazu Sasaki, Osaka; Takaaki Oohara, Hyogo, and Masahiko Takada, Osaka, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Apr. 26, 1990, Ser. No. 514,604

Claims priority, application Japan, Apr. 29, 1989, 1-110772; Aug. 14, 1989, 1-210493

Int. Cl.[5] G11B *5/027, 15/48*

U.S. Cl. 360—85 **6 Claims**



1. In a magnetic recording-reproduction system having arranged on a chassis a head cylinder, a supply reel support and a take-up reel support for causing a magnetic tape withdrawn from one of the reel supports to travel as reeved around the head cylinder, and further having a tape tension maintaining mechanism provided for the path of travel of the magnetic tape, a band brake mechanism for lightly applying a braking force to the supply reel support, a swing idler mechanism selectively engageable with one of the supply reel support and the take-up reel support to transmit the rotation of a motor to the reel support, and a control plate slidably provided on the chassis and engageable with each of said mechanisms to selectively operate the mechanisms, a magnetic tape back tension device characterized in that the band brake mechanism comprises:

a brake release lever rotatably mounted on the chassis,

a band brake having one end attached to the brake release lever, reeved around the supply reel support and attached at the other end thereof to the tape tension maintaining mechanism, and

a spring for biasing the brake release lever into rotation in a brake applying direction,

the control plate having:

a first contact face movable into contact with the lever biasing spring by the sliding movement of the control plate toward a mode change position to free the brake release lever from the force of the spring, and

a second contact face movable into contact with the brake release lever by the sliding movement to rotate the lever in a brake slackening direction,

the control plate, when in pushing contact with the brake release lever and the spring to hold the supply reel support released from the brake, being slidable gradually away from the brake release lever to cause the brake to gradually act on the supply reel support.

5,070,423

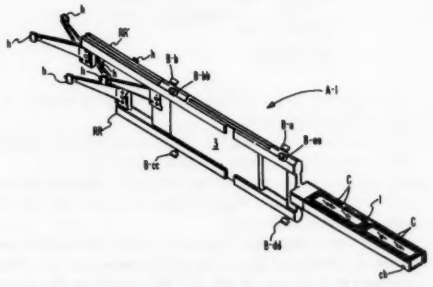
HIGH-PERFORMANCE ACTUATOR ARRAY FOR DISK DRIVE WITH UNITARY ACTUATOR GUIDE MEANS

David Gloski, Mountain View, Calif., assignor to Unisys Corp., Detroit, Mich.

Filed Mar. 6, 1986, Ser. No. 836,950

Int. Cl.[5] G11B *5/55, 21/10*

U.S. Cl. 360—106 **6 Claims**



1. In a magnetic disk drive array wherein a plurality of read-write means are projected into respective inter-disk gaps of a multi-disk stack:

one or more arrays of mounting arms disposed in parallel alignment to be individually reciprocated toward and away form the disk stack, each arm carrying one or several of the read-write means and presenting a pair of first and second side members each adapted to be so reciprocated along a respective first and second path; and

integrated common guide-way means including a first fixed guide plate means rigidly mounted on fixed base means, and adapted to provide guiding, low-friction transport surfaces for all said first side members in the array; a second moveable guide plate means adapted to be coupled to, and biased toward, said first guide plate means, and parallel therewith whereby to engage and provide like guiding low-friction surfaces for all said second side mem-

bers in the array and coupling means joining said first and second guide plate means so as to capture all the arm means guidingly engaging with respective guide means thereof;

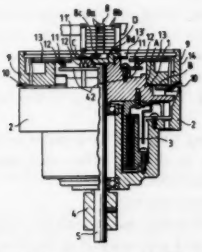
said first and second side members each projecting a plurality of roller means; and said first and second guide means each presenting a set of flat tracks adapted to guidingly engage respective roller means.

5,070,424

ROTARY DRUM ASSEMBLY FOR A VIDEO TAPE RECORDER

Hiroaki Ono; Shinji Ozaki, and Shinji Okada, all of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 7, 1989, Ser. No. 447,556
Claims priority, application Japan, Dec. 28, 1988, 63-331377
Int. Cl.[5] G11B 5/52
U.S. Cl. 360—108 8 Claims



1. A rotary drum assembly for a VTR, the rotary drum assembly comprising:

a plurality of magnetic head means for scanning a magnetic tape to record or reproduce signals;

a rotary drum fixedly holding the magnetic head means on a peripheral portion thereof and having a peripheral cylindrical wall;

a stationary drum disposed beneath and concentric with the rotary drum and having a peripheral wall for guiding the magnetic tape along an outer circumference thereof at a set position and in a predetermined direction;

disk means coaxially fixed to a spindle for detachably holding the rotary drum on a peripheral portion thereof;

a wiring board provided on the rotary drum and connected to terminals of the magnetic head means;

a power feeding unit comprising first power feeding members fixedly held on the disk means concentrically with respect to the spindle, and second power feeding members provided on a fixed portion of the VTR;

a connector holding fixed to the disk means at a position inside an inner circumferential surface of the rotary drum adapted to mate with an outer circumferential surface of the disk means, and having first connecting terminals and second connecting terminals, said inner circumferential surface of said rotary drum and said outer circumferential surface of the disk means forming mating surfaces; and

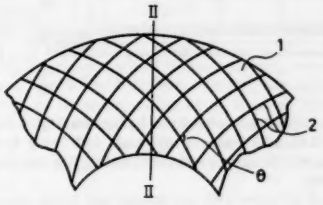
connecting means comprising first connecting members disposed radially inside the mating surfaces of the rotary drum and the disk means and connecting the first connecting terminals on the connector holding member with the wiring board, and second connecting members connecting the second connecting terminals on the connector holding member with the first power feeding members of the power feeding unit.

5,070,425

SURFACE STRUCTURE OF A MAGNETIC DISK

Mitsuo Inumochi, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 339,714, Apr. 18, 1989, abandoned.
This application Feb. 27, 1991, Ser. No. 660,906
Claims priority, application Japan, Apr. 25, 1988, 63-101668
Int. Cl.[5] G11B 5/82
U.S. Cl. 360—135 29 Claims



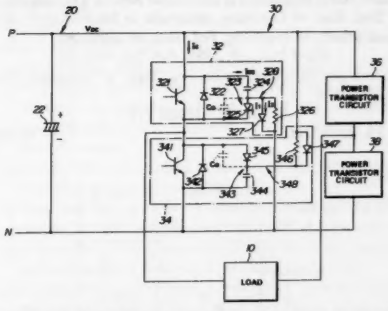
1. A magnetic disk having a surface with two groups of arcuate streaks, the streaks in one of said two groups crossing with multiple streaks in the other group wherein an angle θ of intersection of the streaks is in a range of 10° to 160°.

5,070,426

CLIPPER CIRCUIT FOR POWER TRANSISTOR CIRCUIT AND INVERTER CIRCUIT UTILIZING THE SAME

Masao Iwasa, Chiba, and Yasutami Kito, Aichi, both of Japan, assignors to Otis Elevator Company, Farmington, Conn.

PCT No. PCT/JP88/00458, § 371 Date Mar. 13, 1989, § 102(e) Date Mar. 13, 1989, PCT Pub. No. WO88/09085, PCT Pub. Date Nov. 17, 1988
Continuation of Ser. No. 314,359, filed as PCT/JP88/00458 May 13, 1988, published as WO88/09085 Nov. 17, 1988
Filed Feb. 28, 1990, Ser. No. 488,526
Claims priority, application Japan, May 13, 1987, 62-71248
Int. Cl.[5] H02M 7/5387
U.S. Cl. 361—91 16 Claims



1. A clipper circuit for a power transistor circuit including a power transistor comprising:

a first clipper circuit, adapted to absorb high dv/dt surge voltage, connected in parallel to a collector-emitter circuit of said power transistor and including a capacitor and a first diode; and

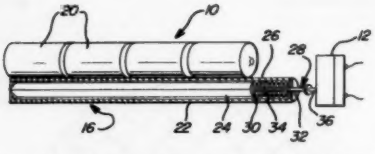
a second clipper circuit, adapted to absorb surge energy generated by wiring inductance upon turning OFF of said power transistor, including a second diode connected to said capacitor in parallel to a discharge resistor wherein said second diode is connected to a junction between said capacitor and said first diode so that current flowing through said capacitor is shunted into a first shunted current flowing through said first diode and a second shunted current flowing through said second diode.

5,070,427

THERMAL SWITCH FOR BATTERY PROTECTION

Carroll H. Bush, Jackson, Mich., assignor to Sparton Corporation, Jackson, Mich.

Filed Jan. 31, 1990, Ser. No. 473,040
Int. Cl.[5] H02H *5/04*
U.S. Cl. 361—104 7 Claims



1. In a circuit powered by a battery having a plurality of cells stacked in a linear array, each cell being individually subject to overheating, means for limiting the cell temperature comprising:

a switch in series with the battery and being closed during circuit operation, and

means for opening the switch when cell temperature exceeds a set value including:

an elongated metal tube thermally coupled with each cell in the array so that the tube is heated by each cell, said metal tube being segmented into isolated thermally conductive portions separated by regions of low thermal conductivity, each conductive portion corresponding to a respective cell and heated thereby.

a fusible material in the tube subject to the temperature of the tube for melting substantially at the set value,

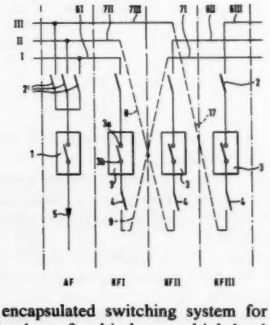
and actuator means including a plunger in the tube and bearing against the fusible material for normally holding the switch closed and opening the switch when the material fuses.

5,070,428

ENCAPSULATED SWITCHING SYSTEM WITH LONGITUDINAL COUPLING OF BUS BARS, INNER PARTITIONS, AND COUPLING FIELDS

Gerhard Harz, Regensburg, and Erwin Reichl, Tegernheim, both of Fed. Rep. of Germany, assignors to Sachsenwerk Aktiengesellschaft, Regensburg, Fed. Rep. of Germany

Filed Nov. 30, 1989, Ser. No. 443,205
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1988, 3840850
Int. Cl.[5] H02B *1/20*
U.S. Cl. 361—341 14 Claims



1. In an encapsulated switching system for longitudinal coupling of bus bars of multi-phase, multiple bus bar systems (I, II, III) installed in an encapsulated switch housing having a front section, a plurality of covers including a rear cover (12) and a top cover (19), inner partitions separating portions the bus bar systems from one another, and a plurality of coupling fields (KFI, KFII, KFIII) in which sections of the bus bars are electrically connected together, and wherein:

(a) at least two bus bars (15*a*, 15*c*) of each multi-phase bus bar system have axes arranged in a plane which is at least approximately parallel to the nearest cover (12, 19);

(b) the bus bars of the respective multi-phase bus bar systems (I, II, III) have first end sections (6I, 6II, 6III) and second end sections (7I, 7II, 7III), the first end sections (6I, 6II, 6III) of the respective bus bar systems (I, II, III) and the second end sections &7I, 7II, 7III) of the respective bus bar systems (I, II, III) being arranged in different coupling fields (KFI, KFII, KFIII), each of the first end sections (6I, 6II, 6III) of the respective bus bar systems (I, II, III) being connected to respective first disconnect switches (2) and coupling switches (3) in the respective coupling fields (KFI, KFII, KFIII) identified as the associated coupling field of the respective bus bar systems (I, II, III);

(c) second disconnect switches (4) are provided in each coupling field (KFI, KFII, KFIII) connected at one end to a respective one of the coupling switches (3) in that coupling field, and coupling lines (8, 9, 17, 18, 21, 22, 28, 29, 81) are provided for connecting the other ends of the second disconnect switches (4) to a connection point (26) at a respective one of the second bus bar end sections (7I, 7II, 7III), the coupling lines being connected to the connection points by way of terminals (16) that are brought through, in an insulated manner, one of (i) a first partition (14*b*) surrounding the respective second bus bar end sections (7I, 7II, 7III) or (ii) one of the housing covers (12, 19); and

(d) the coupling switches have poles arranged in one of a straight line or slightly offset with respect to the front section of the switch housing;

the improvement wherein:

(a) the switch housing has first and second opposite sides, the first bus bar end sections (6I) of the first bus bar system (I) lead from the first side of said housing into a first one of said coupling fields (KFI), the second bus bar end sections (7I) of the first bus bar system (I) lead from the second side of said housing into a second one of said coupling fields (KFII) which is adjacent said first coupling field (KFI), said first and second bus bar end sections (6I, 7I) of the first bus bar system (I) are axially aligned and are electrically connected to one another by way of electrical conductors which extend from the first bus bar end sections (6I) of the first bus bar system (I) downwardly in said first coupling field (KFI) through associated ones of said coupling switches (3) and subsequently by way of a first set of said coupling lines (9) upwardly to the second bus bar end sections (7I) of the first bus bar system (I); and

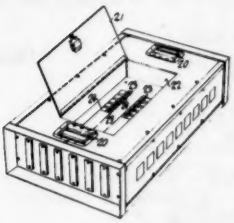
(b) the first bus bar end sections (6II, 6III) of at least one additional bus bar system (II, III) lead into the switching system from the second side of said housing, the second bus bar end sections (7II, 7III) of said at least one additional bus bar system (II, III) are led from the first side of said housing into said first coupling field and passed through one of the rear cover (12) or the top cover (19) and, by way of at least one additional set of said coupling lines (8, 17), behind said rear cover to the nearest respective free coupling field (KFIII) or switching field (AF) and from there downwardly to the associated coupling field (KFII, KFIII) from where said at least one additional set of coupling lines (8, 17) is passed through said rear cover (12) into the associated coupling field (KFII, KFIII) and led, by way of the associated coupling switches (3) within the respective associated coupling field (KFII, KFIII), upwardly for coupling to the first bus bar end sections (6II, 6III) of said at least one additional bus bar section system (II, III).

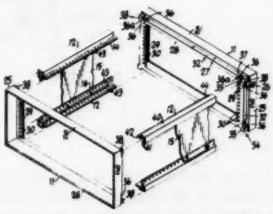
5,070,429

PORTABLE POWER DISTRIBUTION CABINET AND POWER DISTRIBUTION NETWORK WITH REMOVABLE INTERMEDIATE ELECTRICAL CONNECTOR

Stephen J. Skirpan, Port Washington, N.Y., assignor to Union Connector Co., Inc., Roosevelt, N.Y.

Filed Mar. 20, 1990, Ser. No. 496,412
Int. Cl.[5] H02B 1/52, 1/01
U.S. Cl. 361—358 17 Claims





1. A portable electric power distribution cabinet, which comprises:

a cabinet body having an interior and defining at least two enclosure panel receiving openings, each one of said panel receiving openings including panel receiving surfaces formed at the perimeter thereof;

an enclosure panel removably received within each one of said panel receiving openings and removably secured to one respective panel receiving surface;

an electrical connector mounted on each said enclosure panel; and

an intermediate electrical connector mounted within the interior of said cabinet body for removable intercoupling of said electrical connector mounted on one enclosure panel and said electrical connector mounted on the other enclosure panel;

said intermediate electrical connector including a circuit breaker.

14. A portable electric power distribution cabinet, which comprises:

a pair of opposed end frames; and

four cabinet corner rails, each interlocked with and extending between opposed corners of said end frames;

each corner rail comprising:

i) a pair of cabinet corner forming surfaces integrally connected to one another and disposed at right angles to one another;

ii) a pair of enclosure panel receiving surfaces, each extending parallel to and spaced inwardly from a respective corner forming surface; and

iii) a pair of intermediate members, each integral with and extending between a respective enclosure panel receiving surface and its respective cabinet corner forming surface and being disposed at a right angle to each of said respective panel receiving surface and said respective cabinet corner forming surface;

iv) said cabinet corner forming surfaces and said intermediate members defining a volume having a rectangular solid configuration being truncated on each of two sides thereof by said panel receiving surfaces;

each one of said end frames including an interlock member formed at each corner thereof mating with an end of a respective corner rail, each interlock member being disposed on the side of said respective one of said end frames disposed opposite to the other of said end frames;

each interlock member comprising:

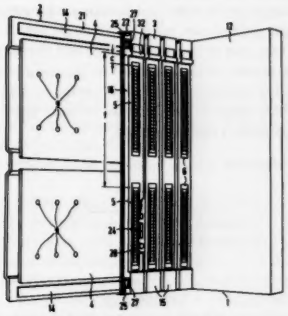
a generally truncated rectangular solid raised from said respective end frame and arranged for reception within said volume.

5,070,430

ELECTRICAL INSTALLATION COMPOSED OF INDIVIDUAL SUBASSEMBLIES

Otto Meusel, Erlangen; Josef Burger, Schmidgaden; Günther Deinhardt, Amberg, and Reinhard Schirbl, Schwandorf, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 18, 1990, Ser. No. 584,295
Claims priority, application European Pat. Off., Sep. 25, 1989, 89117656.2
Int. Cl.[5] H01R 9/00
U.S. Cl. 361—407 28 Claims



1. An electrical installation comprising:

a subassembly;

a subrack,

said subrack comprising

a bus board including secured plug-in connections;

swivel means for electrically connecting said plug in connections to mating connections of the subassembly being mechanically retained at the subrack by said swivel means,

a plastic holder including at least one hole to accommodate said plug-in connections;

at least one first projection being provided on the plastic holder at a defined distance from said at least one hole;

said bus board including at least two positioning holes at a defined distance from said plug-in connections;

said plastic holder further including at least two second projections adapted in position and shape to said positioning holes on a side of said plastic holder turned away from the subassembly;

said second projections and positioning holes being positioned, so that in their joined state, the plug-in connections, situated at a defined distance from the first projection, extend into at least one first hole and are able to be contacted from said side of said plastic holder turned toward the subassembly by the mating connections,

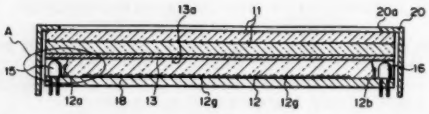
said subassemblies being supportable over a support part on said at least one first projection, which is provided at a distance from the mating connections, said distance from the mating connection conforming with a distance between said at least one first projection and said plug-in connections on the subrack.

5,070,431

DISPLAY BOARD ILLUMINATING DEVICE FOR PASSIVE DISPLAYS

Hideki Kitazawa; Ryohei Terada; Shogo Takeuchi; Tsutomu Kayama; Kohichi Tanimoto; Nobuo Utsugi, and Yoshiaki Nagai, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jul. 30, 1990, Ser. No. 559,358
Claims priority, application Japan, Aug. 3, 1989, 1-202560
Int. Cl.[5] F21V *13/00*
U.S. Cl. 362—31 10 Claims



1. A display board illuminating device for illuminating a display board, comprising:

a light guide plate placed to face the back of said display board to be illuminated, said plate having at least two side ends and a back surface; and

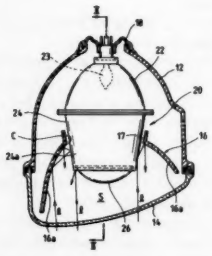
a light source disposed to face at least one of said side ends of said light guide plate and crossing a longitudinal axis of said light guide plate, wherein an angle between a portion of said side end at said light source and the back surface of said guide plate is less than 90° so that said portion of said side end is inclined toward the center of said light guide plate with respect to a normal of said light guide plate directed to said display board.

5,070,432

PROJECTOR-TYPE AUTOMOBILE HEADLAMP HAVING IMPROVED APPEARANCE

Satoshi Kitazumi, and Katsuhisa Saito, both of Shizuoka, Japan, assignors to Koito Manufacturing Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1991, Ser. No. 711,838
Claims priority, application Japan, Jun. 19, 1990, 2-158622
Int. Cl.[5] F21M *3/00*
U.S. Cl. 362—61 7 Claims



1. An automobile headlamp comprising:

a lamp body having a front opening;

a front lens covering said front opening;

a lamp cover disposed in said lamp body, said lamp cover having a front reflecting surface; and

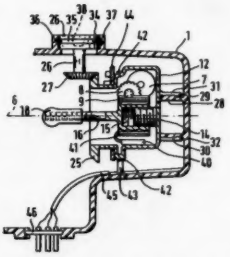
a projector lamp unit mounted in said lamp body, said projector lamp unit having a forward end portion extending through an opening in said lamp cover, an outer surface of said forward end portion being a reflecting surface.

5,070,433

HEADLIGHT FOR A MOTOR VEHICLE HAVING AN ADJUSTABLE MOTOR-DRIVEN REFLECTOR

Ulrich Zillgitt, Remshalden; Harald Speer, Benningen; Kurt Haug, Reutlingen; Georg Ebinger, Kusterdingen; Miervaldis Millers, Reutlingen, and Heinrich Hasselmann, Nürtingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

PCT No. PCT/DE89/00594, § 371 Date Jun. 27, 1990, § 102(e) Date Jun. 27, 1990, PCT Pub. No. WO90/07441, PCT Pub. Date Jul. 12, 1990
PCT Filed Sep. 19, 1989, Ser. No. 536,651
Claims priority, application Fed. Rep. of Germany, Dec. 30, 1988, 3844269
Int. Cl.[5] F21M *3/22*
U.S. Cl. 362—66 9 Claims



1. In a headlight having a headlight housing, a reflector in the headlight housing and an electromotive adjusting device for adjusting the reflector, said adjusting device comprising a housing part, an electric motor, a step-down gear unit connected with the reflector and the electric motor and an adjusting element for adjusting the reflector actuatable by the step-down gear unit, said adjusting element having an axis, the improvement wherein the housing part with the adjusting device is located in the headlight housing and is connected with the headlight housing so as to be held secured with respect to rotation around the axis of the adjusting element preventing said rotation until a predetermined circumferentially applied force applied circumferentially to said housing part is exceeded, with respect to displacement along the axis and with respect to a transverse motion from the axis.

5,070,434

OVERHEAD LIGHT

Michael J. Suman, and Jonathan A. Dykstra, both of Holland, Mich., assignors to Prince Corporation, Holland, Mich.

Filed Oct. 9, 1990, Ser. No. 594,064
Int. Cl.[5] B60Q *3/02*
U.S. Cl. 362—74 20 Claims

1. A light assembly with multiple positions for providing a directionally adjustable spotlight and a floodlight for the interior of a vehicle comprising:

a carrier including a first retention means for holding said carrier in a vehicle, said carrier having a central opening and further including a second retention means for holding a bulb holder in said opening;

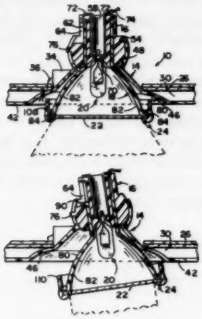
a bulb holder positioned within said opening of said carrier and shaped to cooperate with said second retention means to allow said bulb holder to tilt in multiple directions, and further including receiving means for telescopingly receiving a reflector;

a light bulb operably mounted in said bulb holder;

means for supplying operating power to said light bulb;

a reflector extending into said carrier and telescopingly mounted to said telescoping receiving means of said bulb holder, said reflector telescopingly moveable on said bulb holder for movement between at least first and second

positions, said reflector shaped to reflect light from said light bulb in a floodlight manner when in said first position



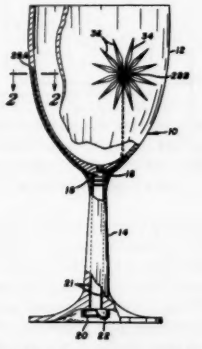
and in a focused spotlight manner when in said second position.

5,070,435

ILLUMINATED SCENIC GLASS

Harvey G. Weller, 613 S. Valley, New Ulm, Minn. 56073

Filed Jun. 4, 1991, Ser. No. 709,990
Int. Cl.[5] F21Y *33/00*
U.S. Cl. 362—101 **5 Claims**



1. An illuminated drinking glass comprising:

(a) a cup having a hollow supporting stem, an upper portion of the cup adjacent to the stem being transparent and having an outer face; and

(b) incandescent illuminating means for illuminating the upper cup, said illuminating means being mounted within the hollow stem adjacent to said cup such as to illuminate the cup through the transparent portion; and

(c) the cup having at least one recess in the face with the recess having a light emitting diode mounted therein; and

(d) battery means, flasher means and switching means connected for selecting intermittent and continuous power to said incandescent illuminating means and said light emitting diode, said switching means being mounted within said hollow stem such as to be operable through the hollow stem.

5,070,436

SIGNAL VEST, COLORED, REFLECTIVE, AND LIGHTED, WORN BY PERSONS SEEN ON AND NEARBY ROADWAYS AND HIGHWAYS AND OTHER NEEDED AREAS

Richard M. Alexander, 12044 20th Ave. S., Seattle, Wash. 98168, and Woodbury Abbey, III, 975 Turkey Rd., Olympia, Wash. 98502

Filed Oct. 29, 1990, Ser. No. 605,238
Int. Cl.[5] F21L *15/06;* **G02B** *5/12*
U.S. Cl. 362—108 **8 Claims**

1. A signal vest, colored, reflective, and lighted with flashing lights, to be worn by persons to be seen on and nearby roadways and highways, comprising:

a) a vest garment made of colorful and reflective materials; and

b) an electrical assembly comprising in turn:

i) a battery supported by the vest garment;

ii) multiple light subassemblies supported by the vest garment and arranged to locate two of them spaced apart on the back of the vest garment respectively on either side of the centerline of a vest garment, and to locate two of them spaced apart on the front of the vest garment, respectively on either side of a centerline of the vest garment;

iii) a switch supported by the vest garment; and

iv) an overall electrical circuit supported by the vest garment, to intermittently supply the electrical energy, derived from the battery, to the respective multiple light subassemblies, when the switch is closed, to create flashing lights to be seen by a motorist of an oncoming vehicle, and arranged in two sub-circuits, with one sub-circuit intermittently supplying electrical energy, derived from the battery, to the multiple light subassemblies arranged on one side of the centerline of the vest garment both the front and back thereof, and with the other sub-circuit intermittently supplying electrical energy, derived from the battery, to the multiple light subassemblies arranged on the other side of the centerline of the vest garment, both the front and back thereof;

wherein each sub-circuit, in turn comprises:

a') a cmos a stable oscillator, in turn comprising;

(i') four IC gates connected in series;

(ii') three resistors connected to and between some of the IC gates;

(iii') a diode; and

(iv') a capacitor connected to and between two IC gates;

b') a darington pair of transistors, comprising in turn:

(i') two transistors;

(ii') Two resistors and the said two transistors, arranged together to form the said darington pair which are connected between the last IC gate and light subassemblies to function as switches; and

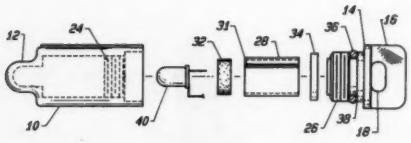
c') the light subassemblies connected to the darington pair of transistors.

5,070,437

ELECTRICAL LIGHT FOR UNDERWATER USE

Joseph M. Roberts, Sr., 1112 Otis Dr., Alameda, Calif. 94501

Filed Oct. 9, 1990, Ser. No. 594,068
Int. Cl.[5] F21V *25/00*
U.S. Cl. 362—158 **13 Claims**



1. A submersible light comprising

a housing body having a closed end and an open end,

a light source positioned in said closed end, said light source having two electrical leads extending therefrom, at least one battery positioned in said housing body and having two electrical terminals, a first lead of said light source engaging one terminal and a second lead being configured with a cantilevered end portion to flex into engagement with the other terminal,

resilient means positioned between said light source and said at least one battery for yieldably separating said first lead and said one terminal of said battery, and

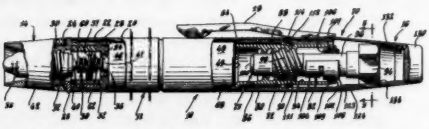
an end cap threadibly engaging said open end and sealing said housing body, said cap urging said one terminal into engagement with said first lead and flexing said second lead into engagement with said other terminal as said cap engages said open end of said housing body.

5,070,438

PEN-SIZE FLASHLIGHT

Francis G. Marshall, Meriden, Conn., assignor to The Bridgeport Metal Goods Mfg. Co., Bridgeport, Conn.

Filed Mar. 21, 1990, Ser. No. 496,682
Int. Cl.[5] F21L *7/00*
U.S. Cl. 362—206 **32 Claims**



1. A flashlight comprising:

A. a tubular body receiving therein at least one cylindrical battery of the type having a front terminal and a rear terminal;

B. a bulb and bulb contact assembly mounted at the forward end of the tubular body and being removable for changing batteries, the bulb contact assembly including

1. a bulb holder threadably secured to the tubular body, the bulb holder mounting the base terminal of the bulb therein,
2. an insulator mounted to the bulb holder and defining an opening extending from a tip terminal of the bulb toward the front terminal of the battery, and
3. a conductive coil spring extending through the insulator opening between the bulb tip terminal and the front battery terminal;

C. a switch assembly mounted at the rearward end of the tubular body, the switch assembly including

1. a switch housing mounted to the tubular body and defining a threaded opening extending rearwardly from the rear battery terminal, and
2. a switch plunger threadably received in the switch housing opening wherein rotation of the switch plunger moves it axially selectively into and out of contact with the rear battery terminal, the switch plunger being electrically connected to the base terminal of the bulb, whereby the flashlight is ON when the switch plunger is in contact with the rear battery terminal; and

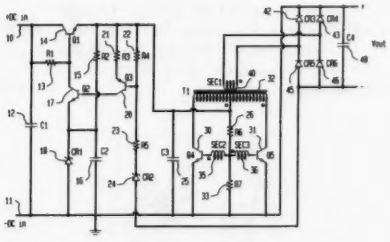
D. a cap extending rearwardly from the tubular body and surrounding the switch assembly, the cap being connected with the switch plunger such that rotation of the cap relative to the tubular body rotates the switch plunger to turn the flashlight ON and OFF.

5,070,439

DC TO DC CONVERTER APPARATUS EMPLOYING PUSH-PULL OSCILLATORS

Joseph D. Remson, San Jose, Calif., assignor to Rolm Corporation, Santa Clara, Calif.

Filed Mar. 12, 1991, Ser. No. 668,005
Int. Cl.[5] H02M *3/337*
U.S. Cl. 363—22 **20 Claims**



1. A DC to DC converter apparatus, comprising:

a push-pull oscillator having first and second transistors each having a base, collector and emitter electrode with the emitter electrodes coupled to a point of reference potential,

a transformer having a center tapped primary winding with a first terminal of said primary winding coupled to said collector electrode of said first transistor, with a second terminal of said primary winding coupled to the collector electrode of said second transistor, said transformer having first, second and third secondary windings, with said center tap of said transformer coupled to the base electrode of said first transistor via said first secondary winding and coupled to the base electrode of said second transistor via said second secondary winding, to cause said blocking oscillator to provide a high frequency square wave output, rectifier means coupled to said third secondary winding to supply an output voltage by rectifying said high frequency square wave,

voltage regulator means coupled to said center tap of said primary winding and adapted to supply a regulated voltage thereto,

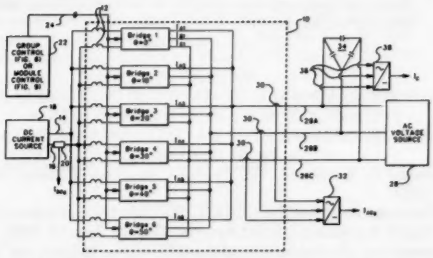
means coupled between said rectifier means and said regulator means and operating to vary the value of said regulated voltage applied to said center tap according to the value of said output voltage and according to the temperature of operation and always in a direction to maintain said output voltage constant.

5,070,440

POWER CONVERSION SCHEME EMPLOYING PARALLELED UNITS

Loren H. Walker, Salem, Va., assignor to General Electric Company, Salem, Va.

Filed Aug. 14, 1990, Ser. No. 567,226
Int. Cl.[5] H02M 7/521
U.S. Cl. 363—71 32 Claims



1. A method of controlling a power conversion apparatus comprised of a plurality of polyphase converter circuits connected in parallel between a DC current source and a AC voltage source comprising the steps:

a) selectively activating said converter circuits to provide polyphase currents at a fundamental frequency corresponding to that of said AC voltage source;

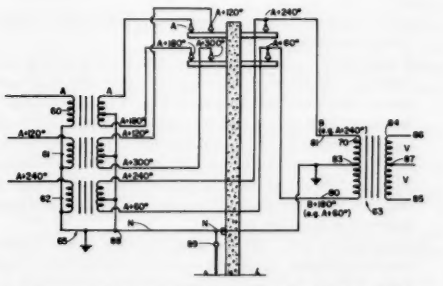
b) selectively interrupting said polyphase currents on an individual basis, said interruption being of generally uniform duration and being substantially evenly distributed in time among the individual circuits of said plurality whereby the magnitude of said currents is adjusted without significant variation in the harmonic content of the total of the currents of said plurality.

5,070,441

DISTRIBUTION OF POWER FROM A SIX PHASE POWERLINE TO ONE- AND THREE- PHASE LOADS

James R. Ashley, 2523 Lake Ellen La., Tampa, Fla. 33618

Filed Dec. 24, 1990, Ser. No. 633,459
Int. Cl.[5] H02M 5/06
U.S. Cl. 363—154 13 Claims



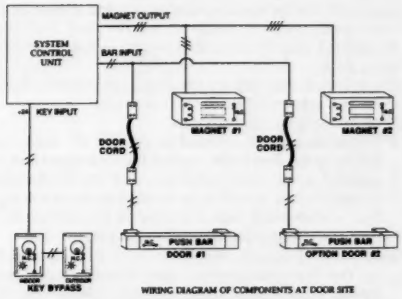
11. Apparatus for connecting a powerline having six phases comprised of six conductors each respectively associated with one of said six phases to a three phase circuit, said apparatus comprising an array of transformers wherein each of said six conductors is connected to one end of a winding of one of said transformers.

5,070,442

COMPUTERIZED DOOR LOCKING AND MONITORING SYSTEM USING POWER-LINE CARRIER COMPONENTS

Ann T. Syron-Townson, and James A. Townson, both of 398 Wales Ct., Marco Island, Fla. 33937

Filed Dec. 14, 1989, Ser. No. 450,432
Int. Cl.[5] G06F 15/20
U.S. Cl. 364—146 7 Claims



WIRING DIAGRAM OF COMPONENTS AT DOOR SITE

2. A computerized system for controlling and monitoring of electro-locking devices at multiple monitored sites including

existing AC power lines which operate from same transformer or coupled transformers;

a monitoring station including a computer and computer program to control and monitor locking devices and including a power line interface connecting computer and said power lines, wherein power line interface includes transmitting and receiving means to handle communications between the computer and the monitored sites;

at each monitored site, a system control unit connected to said power lines and including transmitting and receiving means to communicate with said monitoring station wherein said system control unit selectively controls the status of each of said electro-locking devices according to a schedule selected at said monitoring station.

an electro-locking device with sensor capabilities and wired to to said system control unit;

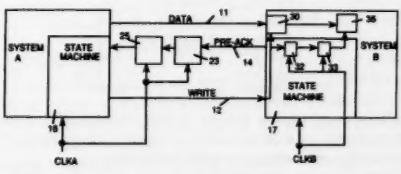
at least one lock by-pass means, and wired to system control unit to monitor its use and to allow egress.

5,070,443

APPARATUS FOR WRITE HANDSHAKE IN HIGH-SPEED ASYNCHRONOUS BUS INTERFACE

Curtis Priem, Fremont, and Chris Malachowsky, Santa Clara, both of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Sep. 11, 1989, Ser. No. 405,544
Int. Cl.[5] G06F 15/16
U.S. Cl. 395—725 6 Claims



1. An apparatus for transferring data across a bus between a first system and second system, said first system operating in accordance with a first clock and said second system operating in accordance with a second clock asynchronous to the first clock, said apparatus comprising:

a write signal line coupled between the first system and second system for asserting a write signal to the second system requesting to transfer data from the first system to the second system;

at least one data signal line coupled between the first system and second system for transferring data from the first system to the second system;

a pre-acknowledge signal line coupled between the second system and the first system for transferring a pre-acknowledge signal to the first system indicating that the second system is ready to receive data from the first system, said pre-acknowledge signal normally asserted indicating that the second system is ready to receive data, said signal de-asserted only if the second system is not ready to receive data;

said first system asserting a write signal and transferring data if the pre-acknowledge signal is asserted;

said second system comprising;

a first latch register coupled to receive the data transferred by the first system across the data signal line, and coupled to the write signal line, said first latch register having a clock signal input coupled to the write signal line whereby said data is latched in accordance to the first clock when the write signal is asserted, and

a second latch register coupled to receive the data latched by the first latch register, said second latch register having a clock signal input coupled to the second clock whereby the data is latched upon assertion of a clock pulse generated derived by the second clock;

whereby the number of clock signals required to transmit data between the first computer system and second computer system is minimized.

5,070,444

STORAGE SYSTEM

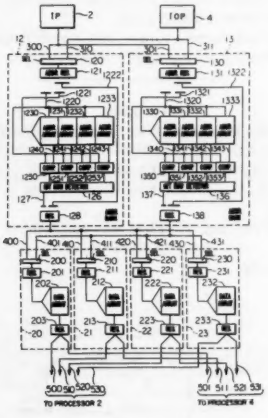
Kanji Kubo; Akio Yamamoto, and Katsumi Takeda, all of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 148,859, Jan. 27, 1988, Pat. No. 4,949,244. This application Aug. 3, 1990, Ser. No. 562,255

Claims priority, application Japan, Feb. 18, 1987, 62-35357

Int. Cl.[5] G06F *12/06*

U.S. Cl. 395—425 **7 Claims**



1. A storage system having a main storage and a buffer storage capable of storing a copy of a part of the content of the main storage, the storage system comprising:

a plurality of address storage banks each connected to a plurality of requesters, the plurality of address storage banks being capable of simultaneously receiving data addresses for the plurality of requesters, wherein the data address contains in its part a block address which designates a block of data in the main storage, and wherein one bank is capable of examining whether data designated by an odd number block address in a data address from one requester is stored in the buffer storage while another bank is examined to determine whether data designated by an even number block address in a data address from another requester is stored in the buffer storage; and

the buffer storage having a plurality of data storage banks, each connected to all of the address storage banks, wherein, when the result of the examination is positive, data assigned to an odd number data address is read out from one bank and data assigned to an even number data address is read out form another bank.

5,070,445

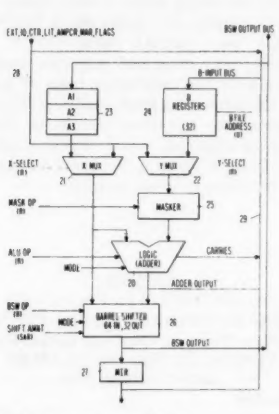
PROGRAMMABLY CONTROLLED PARTIALLY DISTRIBUTED MASKING MECHANISM IN A PROGRAMMABLE UNIT HAVING VARIABLE DATA PATH WIDTHS

Thomas R. Woodward, 878 Westtown Rd., West Chester, Pa. 19382

Continuation of Ser. No. 328,811, Mar. 23, 1989, abandoned, which is a continuation of Ser. No. 207,008, Jun. 13, 1988, abandoned, which is a continuation of Ser. No. 881,240, Jul. 2, 1986, abandoned. This application Nov. 28, 1989, Ser. No. 443,062

Int. Cl.[5] G06F *5/00, 13/38*

U.S. Cl. 395—500 **6 Claims**



1. A processing system comprising:

an arithmetic logic unit having a plurality of function units; and

a control store coupled to said arithmetic logic unit to supply control instructions thereto;

said arithmetic logic unit including data buses coupling said function units together to form said system, said data buses being n-bits wide, said arithmetic logic unit also including means coupled to said control store for producing a mask signal in response to a control instruction provided by said control store, said mask signal being indicative of whether all of the bits of said buses or only m bits are to be used in response to said control instruction from said control store where m is less than n;

said arithmetic logic unit including masking means responsive to said mask signal and coupled between two of said buses to block the passage of n-m bits of said data buses are to be used;

said masking means including a plurality of bit cells, one for each of said n bits of said data buses, and a mask generator coupled to said bit cells and to said control store to receive a mask amount specifying those bits of said data buses that are to be blocked from passing through said bit cells, said

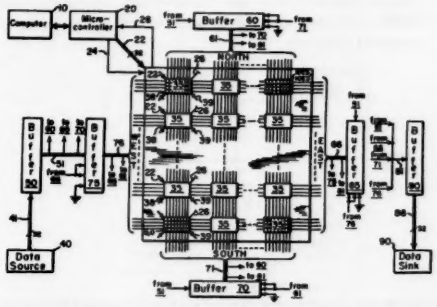
mask generator being a memory means having sets of signals to partially decode the mask amount received from said control store.

5,070,446

METHOD OF SIMULATING A HEXAGONAL ARRAY OF COMPUTER PROCESSORS AND/OR MEMORIES

James B. Salem, Boston, Mass., assignor to Thinking Machines Corporation, Cambridge, Mass.

Continuation of Ser. No. 275,694, Nov. 13, 1988, abandoned, which is a continuation of Ser. No. 825,510, Feb. 3, 1986, abandoned. This application Feb. 8, 1991, Ser. No. 654,410
Int. Cl.[5] G06F *15/16, 15/76, 15/80*
U.S. Cl. 395—500 5 Claims



1. In a computer in which a plurality of processors are physically interconnected in a rectilinear grid, a method of simulating a hexagonal array of processors having first, second and third axes in said grid, said first axis running in either the horizontal or the vertical direction in said grid, the second axis running generally from the upper left to the bottom right of the grid in a first zig-zag pattern between processors in the grid and the third axis running generally from the upper right to the bottom left of the grid in a second zig-zag pattern between processors in the grid, each zig-zag pattern comprising a succession of two alternating elements one of which is a diagonal element extending between processors in two adjacent rows and two adjacent columns of the grid and the other of which is a vertical or horizontal element perpendicular to the first axis and extending between processors in adjacent rows or columns of the grid, said method comprising the steps of:

defining in computer code a relationship between each processor and six other processors, a first pair of said other processors being located on opposite sides of said processor on the first axis, a second pair of said other processors being located on opposite sides of said processor on the second axis, and a third pair of said other processors being located on opposite sides of said processor on the third axis;

executing said computer code to determine for each processor its six nearest neighbor processors and to provide:

communication between each processor and the first pair of processors located on opposite sides of said processor on the first axis in said rectilinear grid;

communication between each processor and the second pair of processors located on opposite sides of said processor on the second axis in said rectilinear grid; and

communication between each processor and the third pair of processors located on opposite sides of said processor on the third axis in said rectilinear grid;

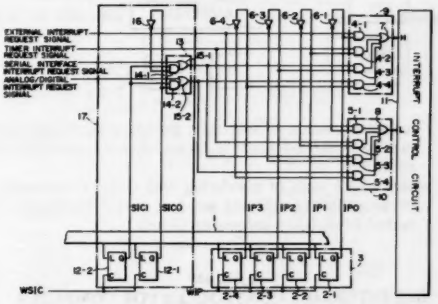
whereby communication is provided between each processor and six nearest neighbor processors on said first, second and third axes in the rectilinear grid.

5,070,447

INTERRUPT CIRCUIT AND INTERRUPT PROCESSING METHOD FOR MICROCOMPUTER

Hiroshi Koyama, Isesakishi, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Dec. 28, 1989, Ser. No. 458,427
Claims priority, application Japan, Jan. 19, 1989, 1-10209
Int. Cl.[5] G06F *9/46*
U.S. Cl. 395—725 4 Claims



1. An interrupt circuit for a microcomputer, comprising:

(a) an interrupt control circuit having a first input terminal to which a first interrupt request signal assigned to high priority level is applied, and a second input terminal to which a second interrupt request signal assigned to a low priority level is applied, said interrupt control circuit being capable of performing an interrupt processing based on each interrupt request signal;

(b) a first priority assignment control circuit for producing said first and second interrupt request signals to said first and second input terminals, which is capable of assigning one of said high priority level and said low priority level to each of a plurality of interrupt request signals; and

(c) a second priority assignment control circuit for producing a software interrupt request signal to said second input terminal, which is capable of assigning a low priority level to said software interrupt request signal different from said plurality of interrupt request signals, said software interrupt request signal being produced while a minimum required interrupt processing based on said first interrupt request signal is being carried out so that an interrupt processing based on said second interrupt request signal is carried out before said software interrupt request signal enables a remaining interrupt processing based on said first interrupt request signal.

5,070,448

METHOD FOR TESTING A MICROPROGRAMMED INPUT/OUTPUT INTERFACE USING STEAL TECHNIQUES

Donald R. Crandall, Boca Raton, Fla., assignor to International Business Machines Coproration, Armonk, N.Y.

Continuation of Ser. No. 448,099, Dec. 9, 1982, abandoned. This application Dec. 9, 1985, Ser. No. 830,891
Int. Cl.[5] G06F *11/00, 11/30*
U.S. Cl. 395—575 11 Claims

1. A method for interfacing with operations of an I/O controller of a data processing system including a host processor and said I/O controller, comprising at said host processor using an electronic device to perform the steps of:

loading a program for interrogation and testing into a random access memory of said I/O controller through said host processor on a cycle steal basis;

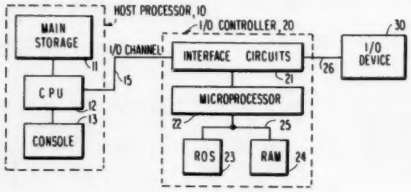
clearing a predetermined portion of a main storage unit in said host processor;

inputting through a console of said host processor into said

predetermined portion of said main storage unit, information comprising data and/or instructions for use by said program; and

cycle stealing, on a cycle steal basis controlled by said program in said I/O controller, information from said predetermined portion of said main storage unit of said host processor to said random access memory of said I/O controller;

wherein such steps of interfacing with said I/O controller occur without employing any test device externally attached to said data processing system.

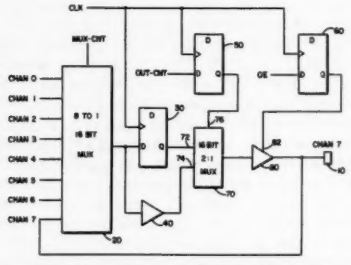


5,070,449

BUS INTERFACE CONTROLLER FOR COMPUTER GRAPHICS

John F. Dawson, Albuquerque; Glenn M. Courtright, Rio Rancho, and Douglas A. Fischer, Albuquerque, all of N. Mex., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 19, 1988, Ser. No. 287,100
Int. Cl.[5] G06F *13/00*
U.S. Cl. 395—325 **4 Claims**



1. A bus multiplexer having a plurality of multi-bit channels, a clock signal, a mux-control signal, an output enable signal, and an out-count signal, the bus multiplexer comprising:

(a) a first multiplexer means for selecting any one of the multi-bit channels wherein the first multiplexer means has a plurality of multi-bit channel inputs wherein each multi-bit channel input is connected to a separate one of the multi-bit channels, a first select input connected to the mux-control signal and a first mux output channel, wherein the first multiplexer means selects a multi-bit channel in response to the mux-control signal;

(b) a first data latching means for latching the first mux output channel having a first clock enable signal input connected to the clock signal, a first channel input connected to the first mux output channel, and wherein the first data latching means further comprises a first data output channel;

(c) a second data latching means for latching the out-count signal having a second clock enable input connected to the clock signal, a second data input connected to the out-count signal, and wherein the second data latching means further comprises a first data output signal;

(d) a third data latching means for latching the output enable signal having a third clock enable input connected to the clock signal, a third data input connected to the output enable signal, and wherein the third data latching means further comprises a second data output signal;

(e) a first buffer means for transmitting a channel connected to the first mux output channel having a first buffer output channel;

(f) a second multiplexer means for selecting a multiplexed multi-bit channel having a second select input connected to the first data output signal, a latched channel input connected to the first data output channel, and a buffered channel input connected to the first buffer output channel, wherein the second multiplexer further comprises a second mux output channel wherein the multiplexed multi-bit channel is selected in response to the first data output signal; and

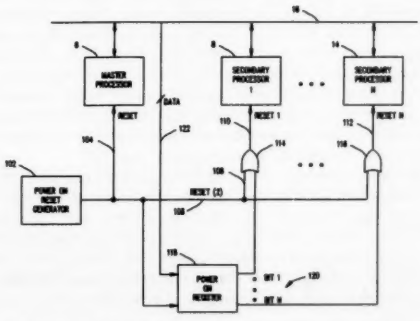
(g) a second buffer means for gating a signal having a transmit control connected to the second data output signal with a second buffer input connected to the second mux output channel, the second buffer means having a second buffer output connected to any one of the plurality of multi-bit channels.

5,070,450

POWER ON COORDINATION SYSTEM AND METHOD FOR MULTIPLE PROCESSORS

Thomas H. Holman, Jr., and David R. Lunsford, both of Austin, Tex., assignors to Dell USA Corporation, Austin, Tex.

Filed May 25, 1990, Ser. No. 532,045
Int. Cl.[5] G06F *11/00*
U.S. Cl. 395—750 **12 Claims**



1. A computer system comprising:

a first processor;

a second processor;

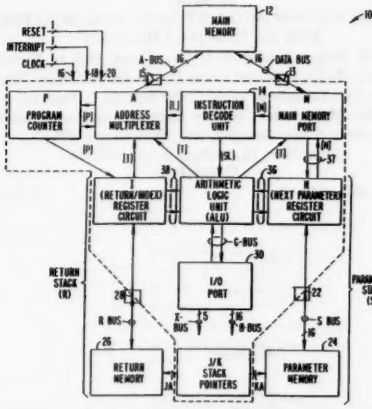
a bus connected to and shared by said first processor and said second processor; and a power on reset coordination means for said first processor and said second processor, said power on reset coordination means comprising means connected to said first and second processors for resetting said first processor and said second processor substantially simultaneously; and means connected to said first and second processors for deasserting reset to said first processor and to said second processor sequentially to prevent conflicting accesses to the bus by the first and second processors.

5,070,451

FORTH SPECIFIC LANGUAGE MICROPROCESSOR

Charles H. Moore, Woodside, Calif., and Robert W. Murphy, Scottsdale, Ariz., assignors to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 673,694, Nov. 21, 1984, abandoned. This application Apr. 10, 1989, Ser. No. 336,632
Int. Cl.[5] G06F *12/00*
U.S. Cl. 395—375 12 Claims



1. A processor adapted to receive instructions and to execute multiple operations of a single instruction in parallel, comprising:

an instruction latch;

a main memory data port coupled to said instruction latch;

an instruction decode circuit for decoding an instruction in said instruction latch coupled to said instruction latch and having a plurality of control signal outputs;

a main memory address port coupled to a first one of said control signal outputs;

an arithmetic logic unit having a control input coupled to a second one of said control signal outputs and a first operand input;

an ALU multiplexer having an output coupled to said first operand input of said arithmetic logic unit, a first input coupled to said main memory data port via a first data path, and a select input coupled to a third one of said control signal outputs;

a top register coupled to an output of said arithmetic logic unit;

a next parameter register coupled to a second input of said ALU multiplexer via a second data path;

an index/return register coupled to a third input of said ALU multiplexer via a third data path;

a next parameter memory having a data I/O coupled to said next parameter register, said next parameter memory, next parameter register and top register forming a single parameter stack;

an index/return memory having a data I/O coupled to said index/return register for storing an index/return stack;

K stack pointer means having only a single pointer register for generating a pointer address for said next parameter memory having an output coupled to an address input of said next parameter memory and an input coupled to a fourth one of said control signal outputs; and

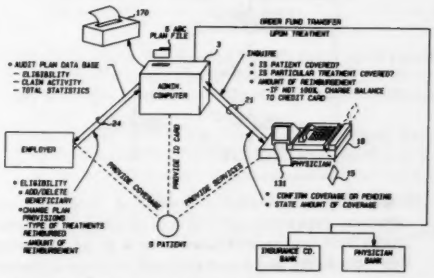
a J stack pointer circuit for generating a pointer address for said index/return memory having an output coupled to an address input of said index/return memory and an input coupled to a fifth one of said control signal outputs.

5,070,452

COMPUTERIZED MEDICAL INSURANCE SYSTEM INCLUDING MEANS TO AUTOMATICALLY UPDATE MEMBER ELIGIBILITY FILES AT PRE-ESTABLISHED INTERVALS

Findley C. Doyle, Jr., Rochester, and William D. Alcott, III, Grosse Pointe Farms, both of Mich., assignors to NGS American, Inc., St. Clair Shores, Mich.

Division of Ser. No. 68,240, Jun. 30, 1987. This application Oct. 17, 1989, Ser. No. 422,625
Int. Cl.[5] G06F *15/42*
U.S. Cl. 364—401 9 Claims



1. Apparatus for updating a central data base consisting of the identities of beneficiaries who at a point in time are members of an employment group having post-membership option rights for continuing health care benefits comprising:

a file of predetermined time spans between active and pending states of benefit plan eligibility based on the status of association between the beneficiary and the employment group;

a clock function means responsive to changes in beneficiary member status for updating the beneficiary plan eligibility state in the file at said predetermined time spans; and

a two-way data communication link between at least one benefit provider and the file for inputting member identification information and receiving current data representing the status of the beneficiary relevant to the employment group and plan eligibility during both active and pending status periods.

5,070,453

SYSTEM AND METHOD FOR SCHEDULING DATA TRANSFERS AMONG A PLURALITY OF DATA PROCESSING UNITS TO AVOID CONFLICTING DATA REQUESTS

Jeffrey L. Duffany, Morristown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 10, 1989, Ser. No. 335,333
Int. Cl.[5] G06F *15/20*
U.S. Cl. 364—402 22 Claims

1. A method for scheduling data transfers among a plurality of processing devices over a predetermined number of message carrying channels comprising the steps of:

receiving a plurality of requests for data transfers from said processing devices;

identifying conflicts in requested data transfers by generating a signal identifying the interferences in data carrying channels among the message transfer requests;

specifying an initial transfer schedule by selecting a signal representing a non-interfering data transfer schedule; and

improving the non-interfering message transfer schedule signal including;

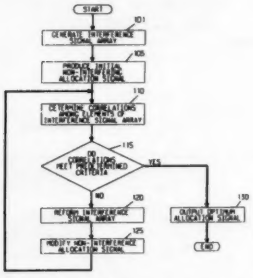
determining correlations in the identified data carrying channel interferences signal among the message transfer requests;

comparing the determined correlations in the identified data

carrying channel interferences signal to predetermined criteria,

modifying the non-interfering data transfer schedule signal responsive to the determined correlations, and

reforming the signal identifying the interferences in data carrying channels among the data transfer requests responsive to the determined correlations,



the sequence of determining, comparing, modifying and reforming steps being repeated until the determined correlations meet the predetermined criteria in the comparing step "scheduling said data transferred to selected processing devices in response to said sequences of determining, comparing, modifying, and reforming, " and "performing said data transfers".

5,070,454

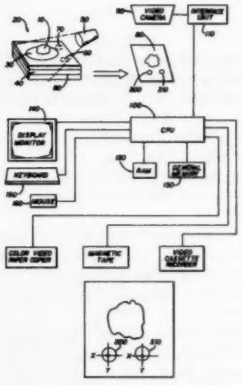
REFERENCE MARKER ORIENTATION SYSTEM FOR A RADIOGRAPHIC FILM-BASED COMPUTERIZED TOMOGRAPHY SYSTEM

Lionell K. Griffith, Acton, Calif., assignor to Olganix Corporation, Reseda, Calif.

Continuation of Ser. No. 172,609, Mar. 24, 1988. This application Apr. 30, 1990, Ser. No. 516,649

Int. Cl.[5] G01N *23/00*

U.S. Cl. 364—413.13 **3 Claims**



1. An apparatus for representing the internal structure of an object, comprising:

means for exposing said object to penetrating radiation;

means for rotating said object, said rotating means being disposed within a housing in angular relationship to said exposing means;

film cassette means for storing radiographic film, said film cassette means being positioned within said housing beneath said rotating means; and

at least two reference markers for providing a reference relative to said object, said reference markers being positioned between said rotating means and a sheet of radiographic film in said film cassette means and positioned so that their centers constitute the base points of an equilateral triangle, the apex point thereof being the center of the rotation means.

5,070,455

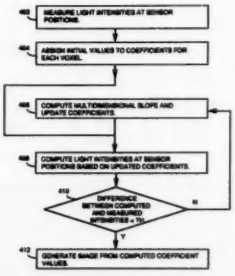
IMAGING SYSTEM AND METHOD USING SCATTERED AND DIFFUSED RADIATION

Jerome R. Singer; Francisco A. Grunbaum, both of Berkeley; Philip D. Kohn, Oakland; Jorge P. Zubelli, Berkeley; John L. Couch, San Francisco, all of Calif.; Harold L. Naparst, Somerville, Mass., and Geoffrey Latham, Braddon, Australia, assignors to Singer Imaging, Inc., Berkeley, Calif.

Filed Nov. 22, 1989, Ser. No. 440,088

Int. Cl.[5] G06F *15/00*

U.S. Cl. 364—413.19 **16 Claims**



1. A system for generating images corresponding to the internal characteristics of an object, comprising:

radiating means for generating a directed beam of radiation, said beam being directed at distinct times at each of a multiplicity of input positions around an object;

sensor means arrayed around at least a portion of said object for measuring the intensity of radiation emerging from said object at a multiplicity of sensor positions;

data storage means, coupled to said sensor means, for storing a multiplicity of sets of measured intensity values, each set of intensity values corresponding to the intensities of radiation measured by said sensor means while said radiating means is generating a beam directed at distinct ones of said input positions;

reconstruction means, coupled to said data storage means, for reconstructing a composite image of a portion of the interior of said object, said reconstructing means computing, using said stored intensity values, an array of image data values comprising radiation attenuation and radiation scattering coefficients which characterize both radiation attenuation and scattering characteristics of said portion of the interior of said object.

5,070,456

METHOD FOR FACILITATING THE SORTING OF NATIONAL LANGUAGE KEYS IN A DATA PROCESSING SYSTEM

Denis Garneau, Toronto, Canada, and Wen-Hsiu Sears, Fort Worth, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1989, Ser. No. 458,044

Int. Cl.[5] G06F *15/38*

U.S. Cl. 364—419 **6 Claims**

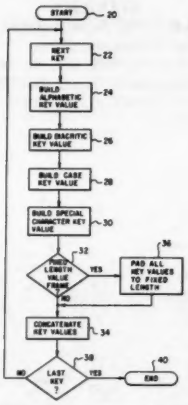
1. A method in a data processing system for facilitating the

sorting of national language keys, said method comprising the steps of:

assigning a selected alphabetic key value for each of said national language keys;

assigning a selected diacritic key value for each of said national language keys;

establishing a fixed length place value data frame for each of said national language keys, each of said fixed length place value data frames having a most significant digit, a least



significant digit, a fixed portion of said fixed length place value data frame containing said selected alphabetic key value and a fixed portion of said fixed length place value data frame containing said selected diacritic key value; and

thereafter determining a sort precedence between any two selected national language keys by a comparison of the fixed length place value data frames associated with said two selected national language keys.

5,070,457

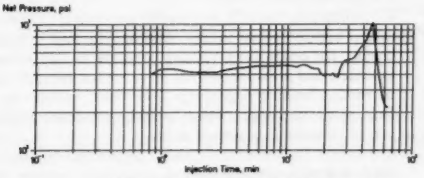
METHODS FOR DESIGN AND ANALYSIS OF SUBTERRANEAN FRACTURES USING NET PRESSURES

Don K. Poulsen, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jun. 8, 1990, Ser. No. 535,799

Int. Cl.[5] G01V *1/00;* **E21B** *47/00*

U.S. Cl. 364—420 **3 Claims**



Net pressure profile: monitoring/analysis example.

1. A method for determining the geometry of a fracture created in a subterranean formation comprising the steps of:

(a) injecting fluid into said subterranean formation;

(b) monitoring the net fracturing pressure as a function of the fluid injection rate over time;

(c) determining the fluid volume injected for a fixed time period from the injection rate of fluid;

(d) adding the volume determined from step (c) to the volume of fluid injected into said subterranean formation prior to said fixed time period;

(e) determining the volume of fluid lost into said subterranean formation from previously created fracture area;

(f) calculating an upper bound on fracture length according to the equations:

$$2\pi \frac{(1-\nu^2)}{E} \Delta PHL^2 = \int_0^t Q(t)dt - V_{fl}(L)$$

$$4\frac{\pi}{5} \frac{(1-\nu^2)}{E} \Delta PH^2L = \int_0^t Q(t)dt - V_{fl}(L)$$

$$\frac{16}{3} \frac{(1-\nu^2)}{E} \Delta PR^3 = \int_0^t Q(t)dt - V_{fl}(R)$$

(g) estimating a first fracture length based upon previous bounds of fracture length;

(h) determining volume of fluid loss using said first fracture length;

(i) calculating a second fracture length according to step (f);

(j) comparing the first fracture length determined in step (g) to the second fracture length determined in step (i) to determine whether the difference between the two is within acceptable tolerance;

(k) repeating steps (g) through (i) until an acceptable tolerance is achieved;

(l) determining fracture width; and

(m) using said net fracturing pressure behavior to design a fracture treatment.

5,070,458

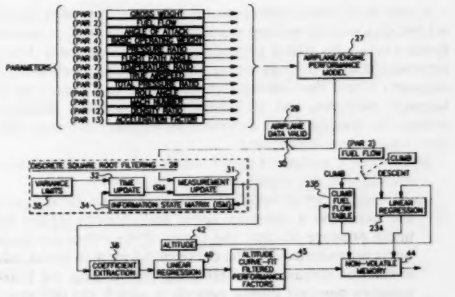
METHOD OF ANALYZING AND PREDICTING BOTH AIRPLANE AND ENGINE PERFORMANCE CHARACTERISTICS

John P. Gilmore, and Dereck B. Clark, both of Glendale, Ariz., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 31, 1989, Ser. No. 332,648

Int. Cl.[5] G06F *7/70, 15/48;* **G05B** *13/04;* **G05D** *1/00*

U.S. Cl. 364—424.06 **16 Claims**



1. A method of determining aircraft/engine performance for a current flight, wherein predefined performance parameters define the performance characteristics of the aircraft/engine combination, said method comprising the steps of:

(a) based on the performance parameters learned from flights prior to the current flight, predicting the performance of the aircraft/engine combination for predetermined conditions;

(b) learning the performance parameters of the aircraft/engine combination during the current flight, using previously learned performance parameters, including climb, cruse, and descent phases of said current flight, said learning including;

(i) modeling the aircraft/engine to a mathematical model which includes predefined performance parameters;

(ii) filtering the output of the mathematical model such that the performance parameters mean and standard deviations provide a best curve fit for predetermined inputs to the mathematical model;

(iii) extracting the newly generated performance parameters obtained from the filtering step; and

(iv) curve fitting the performance parameters to altitude;

(c) saving the altitude curve fit performance parameters of step (b, iv) in a storage element; and

(d) repeating steps a-c, thereby iterating the method of determining aircraft/engine performance on a predetermined time period during the entire current flight.

5,070,459

ANTI-BLOCKING AND/OR WHEEL SLIP REGULATING SYSTEM

Anton Van Zanten, Ditzingen; Wolf-Dieter Ruf, Waldstetten; Friedrich Kost, Stuggart, and Karl-Josef Weiss, Waiblingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

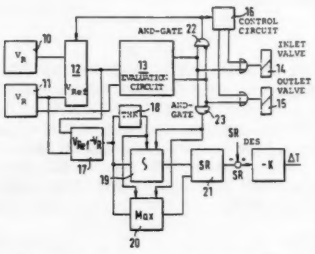
PCT No. PCT/EP88/00883, § 371 Date Apr. 16, 1990, § 102(e) Date Apr. 16, 1990, PCT Pub. No. WO89/03331, PCT Pub. Date Apr. 20, 1989

PCT Filed Oct. 5, 1988, Ser. No. 469,604

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1987, 3734878

Int. Cl.[5] B60T *8/10*

U.S. Cl. 364—426.02 **9 Claims**



1. Anti-lock brake control system for controlling slippage of wheels on a vehicle moving at a speed represented by a vehicle speed curve, the wheel slippage versus braking force being represented by a slippage curve having a stable portion (low slippage) where the braking force increases to a maximum as slippage increases, and an unstable portion (high slippage) where the braking force decreases as slippage increases further, said system comprising

at least one wheel speed sensor which generate signals corresponding to the wheel speed,

an evaluation circuit which receives said wheel speed signals and generates a reference speed and slippage signals for brake pressure control, the curve of the reference speed being approximated to the curve of the vehicle speed, said evaluation circuit means effecting maintaining the brake pressure constant during periods in which the difference between the wheel speed and the reference speed does not exceed a prescribed value,

brake pressure control means actuated by said slippage signals and causing a variation in brake pressure depending upon wheel slippage, said brake pressure control means effecting pressure build-up, pressure reduction, and maintaining the pressure constant, and

means for effecting a pulse-like brake pressure change during a period in which said evaluation circuit means effects maintaining the pressure constant,

means for determining a stability reserve from the reference speed and the wheel speed which result from the pulse-like pressure change, and

means for deriving a signal from the stability reserve for changing the brake pressure so as to adjust the slippage to be on the stable portion of the slippage curve and at the maximum braking force.

5,070,460

ANTI-SKID BRAKE CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE SELECTIVE OF TWO WHEEL DRIVE MODE AND FOUR WHEEL DRIVE MODE AND TECHNOLOGY OF CORRELATION OF BRAKE CONTROL AND POWER TRAIN CONTROL FOR OPTIMAL BRAKING EFFICIENCY AND ENHANCED STABILITY

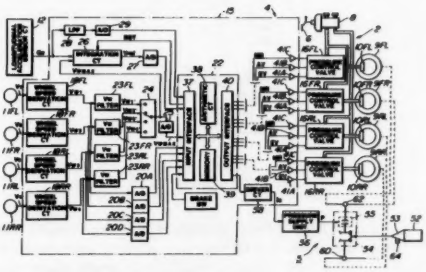
Yoshiki Yasuno, Kanagawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jun. 22, 1989, Ser. No. 369,237

Claims priority, application Japan, Jun. 22, 1988, 63-154306

Int. Cl.[5] B60T *8/32*; B60K *17/34*

U.S. Cl. 364—426.02 **9 Claims**



1. A combination comprising:

a power train control system associated with an automotive internal combustion engine for distributing driving torque generated by said engine to primary and secondary wheels, said power train control system being operative for adjusting power distribution between said primary and secondary wheels in such a manner that full power is distributed to said primary wheels in a two wheel drive mode and even power is distributed in a complete four wheel drive mode, said power distribution being varied between said two wheel drive mode and said complete four wheel drive mode;

an anti-skid brake control system for controlling braking pressure for maintaining wheel slippage in the vicinity of a predetermined optimum level, said antiskid control system comprising

a braking circuit connecting a pressurized fluid source to a wheel cylinder for each of said front and rear wheels for building up braking pressure in said wheel cylinder,

pressure control valve means, disposed in said braking circuit, for controlling braking pressure in said wheel cylinder, said pressure control valve means operable for increasing braking pressure in said wheel cylinder in a first mode and decreasing braking pressure in said wheel cylinder in a second mode,

a first sensor for monitoring rotation speed of an associated one of said primary and secondary wheels for producing a wheel speed indicative signal;

second means for deriving said wheel slippage on the basis of said wheel speed indicative signal and producing wheel slippage data;

third means for producing a first control signal for controlling operation modes of said pressure control valve means for switching said operation modes between said first mode and said second mode in order to maintain said wheel slippage in the vicinity of said predetermined optimum level on the basis of said wheel slippage data; and

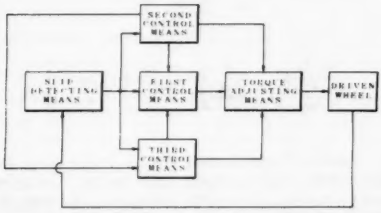
fourth means for controlling said power train control system for adjusting said power distribution depending upon a preselected vehicle driving parameter including vehicle body speed representative data derived from said wheel speed indicative signal, said fourth means being active for selecting an increased power distribution ratio for said secondary wheels depending upon an increased value of said vehicle body speed representative data during an active state of said third means.

5,070,461

SLIP CONTROL SYSTEM FOR A VEHICLE

Kazutoshi Nobumoto; Toshiaki Tsuyama; Toru Onaka, and Yutaka Tsukahara, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Mar. 12, 1990, Ser. No. 491,864
Claims priority, application Japan, Mar. 10, 1989, 1-58140
Int. Cl.[5] B60T *8/32*
U.S. Cl. 364—426.03 **22 Claims**



1. A slip control system for a vehicle, comprising:
a torque adjusting means for adjusting torque to be applied to a driven wheel;
a slip-value detecting means for detecting a slip value of the driven wheel on a road surface;
a first control means for subjecting the torque adjusting means to feedback control so as to allow the slip value of the driven wheel to reach a predetermined target value in response to output from the slip-value detecting means;
a second control means for reducing the torque to be applied to the driven wheel temporarily by a predetermined decrement by controlling the torque adjusting means prior to the first control means when the slip value detected by the slip-value detecting means reaches a first judgment value set as a value greater than the predetermined target value; and
a third control means for reducing the torque to be applied to the driven wheel gradually by controlling the torque adjusting means prior to the first control means when the slip value detected by the slip-value detecting means does not reach a second judgment value set as a value smaller than the first judgment value even if a predetermined period of time elapses after start of control by the second control means.

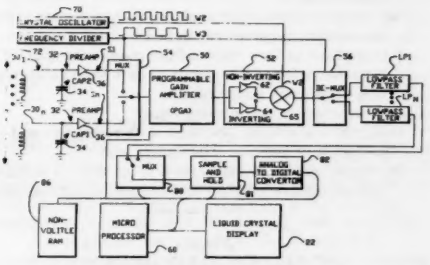
5,070,462

DEVICE FOR LOCATING A BORING MACHINE

Albert W. Chau, Redmond, Wash., assignor to FlowMole Corporation, Kent, Wash.

Filed Sep. 12, 1989, Ser. No. 406,769
Int. Cl.[5] G01S *5/04*
U.S. Cl. 364—460 **20 Claims**

19. An apparatus for calculating and displaying a plurality of orders of an underground object's location and depth; said apparatus comprising:
transmitting means located at said object for transmitting a homing signal;
receiving means for receiving said homing signal;
signal processing means electrically coupled to said receiving means for sampling said received homing signal over a plurality of predefined time intervals, and for each said predefined time interval, said signal processing means calculating an object location and depth value based on the signal samples taken during said corresponding predefined time interval and including a signal noise filtering



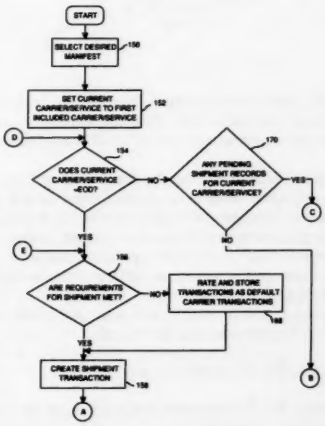
assembly in which multiplexed signals pass sequentially through a demultiplexer, selected ones of a plurality of filters and a multiplexer; and
a display means coupled to said signal processing means for displaying each order of said location and depth values.

5,070,463

PARCEL PROCESSING SYSTEM WITH END OF DAY RATING

Jurgen Schuricht, Louteral, and Armin Zeiss, Lindenfels/Odw., both of Fed. Rep. of Germany, assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Nov. 5, 1990, Ser. No. 608,944
Int. Cl.[5] G01G *19/40*
U.S. Cl. 364—464.02 **14 Claims**


START
SELECT DESIRED MANIFEST
SET CURRENT CARRIER/SERVICE TO FIRST INCLUDED CARRIER/SERVICE
DOES CURRENT CARRIER/SERVICE =EOD?
ANY PENDING SHIPMENT RECORDS FOR CURRENT CARRIER/SERVICE?
ARE REQUIREMENTS FOR SHIPMENT MET?
RATE AND STORE TRANSACTIONS AS DEFAULT CARRIER TRANSACTIONS
CREATE SHIPMENT TRANSACTION

1. A parcel processing system for providing shipping documents required for a plurality of classes of service, comprising:
(a) selection means for sending carrier/service selection signals;
(b) entry means for entering transaction data;
(c) a memory;
(d) means for generating a manifest; and
(e) a processor connected to said selection means, said entry means, said memory and said generating means; said processor being programmed to:
(i) receive a carrier/service selection signal, said signal indicating selection of one of said plurality of classes of service for a parcel transaction;

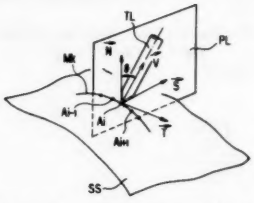
(ii) receive transaction data for said parcel transaction;
(iii) determine on the basis of said carrier/service selection signal, whether said parcel transaction is to be rated or deferred;
(iv) if said parcel transaction is to be deferred, store said transaction data in said memory without rating said transaction;
(v) repeat functions (i) through (iv) with respect to at least one additional parcel transaction;
(vi) combine at least some of the transaction data of at least two deferred transaction so as to form an aggregation of deferred transactions;
(vii) receive a deferred rating signal;
(viii) perform a rating operation with respect to said aggregation of deferred transactions; and
(ix) cause said generating means to generate a manifest, said manifest reflecting a result of said rating operation.

5,070,464

NC DATA CREATION METHOD

Masaki Seki, Tokyo; Koji Samukawa, and Osamu Hanaoka, both of Yamanashi, all of Japan, assignors to Fanuc Ltd., Yamanashi, Japan

PCT No. PCT/JP88/01025, § 371 Date Jun. 13, 1989, § 102(e) Date Jun. 13, 1989, PCT Pub. No. WO89/03550, PCT Pub. Date Apr. 20, 1989
PCT Filed Oct. 7, 1988, Ser. No. 368,307
Claims priority, application Japan, Oct. 15, 1987, 62-260075
Int. Cl.[5] B23Q *15/26*
U.S. Cl. 364—474.34 **2 Claims**



1. An NC data creation method for creating, in an automatic programming apparatus, NC data for cutting a sculptured surface by simultaneous five-axis control comprising the steps of:

defining a tool nose path on the sculptured surface, wherein the sculptured surface is specified by a lattice point sequence of a number of longitudinal and horizontal meshes and a predetermined planar curve is projected onto said sculptured surface, so that a point sequence of intersections between the projected curve and the meshes defines the tool nose path;

computing a normal vector at a point Ai on the tool nose path in accordance with the equation

$$\vec{n}=\vec{N}_2+(\vec{N}_1-\vec{N}_2)\,L_2/(L_1+L_2)$$

wherein $\vec{N}_1$, $\vec{N}_2$ represent normal vestors at two lattice points bracketing the point Ai, and L_1, L_2 represent distances from the point Ai to each of the lattice points;

computing a tangent vector tangent to said tool nose path at said point Ai;

determining an outer product vector between said normal vector and said tangent vector;

determining a tool central-axis vector, in a plane containing said normal vector and said outer product vector, in which a direction inclined toward the outer product vector from the normal vector by a designated angle serves as the direction of the tool central axis;

creating NC data for simultaneous five-axis control using coordinates of said Ai and said tool central-axis vector; and

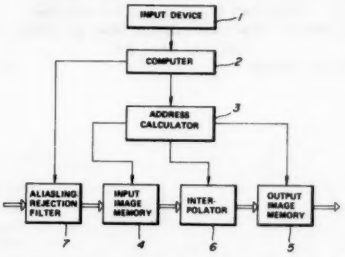
cutting the sculptured surface along the tool nose path using the NC data.

5,070,465

VIDEO IMAGE TRANSFORMING METHOD AND APPARATUS

Tetsuro Kato, Kanagawa, and Yoshiyuki Nakamura, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 22, 1988, Ser. No. 158,922
Claims priority, application Japan, Feb. 25, 1987, 62-42292; Feb. 25, 1987, 62-42293; Feb. 28, 1987, 62-46421
Int. Cl.[5] G06F *15/46*
U.S. Cl. 395—141 **5 Claims**



1. A method of transforming a video image in the form of minute quadrangular segments, each having four apexes as defined by position coordinates, comprising the steps of:

obtaining first position data for the coordinates of each of the four vertices of respective first minute quadrangular regions of the input image;

obtaining second position data for the coordinates of each of four vertices (corners) of respective second minute quadrangular regions into which the first minute quadrangular regions are to be correspondingly transformed;

calculating parameters corresponding to each relationship between the respective first minute quadrangular regions and the respective second minute quadrangular regions using respective pairs of vectors which are congruent with the respective pair of adjacent sides included in each triangular region divided from the second minute quadrangular regions so as to contain the longer diagonal thereof, the respective pairs of adjacent sides constituting a pair of triangles together with the longer diagonal of each second minute quadrangular; and

transforming video information at each point within the respective first minute quadrangular regions into corresponding video information at each point within the respective second minute quadrangular regions using the respective parameters so as to constitute the output video image.

5,070,466

DIGITAL VECTOR GENERATOR APPARATUS FOR PROVIDING MATHEMATICALLY PRECISE VECTORS AND SYMMETRICAL PATTERNS

Bruce M. Anderson, Phoenix, Ariz., and Brian E. Broderick, New Palestine, Ind., assignors to Honeywell Inc., Minneapolis, Minn.

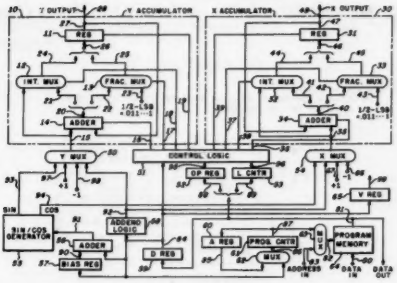
Filed Nov. 1, 1988, Ser. No. 266,048
Int. Cl.[5] G09G *1/16*; G06F *3/14*
U.S. Cl. 395—143 **19 Claims**

1. Vector generator apparatus for generating a vector as a sequence of points from an initial point to an end point through intermediate points therebetween, each said point having first and second coordinates, said apparatus comprising:

first digital accumulator means for accumulating coordinate values having a first integer portion and a first fractional portion, said first integer portion providing a signal repre-

sentative of said first coordinate of each said point of said vector, said first fractional portion having at least significant bit,

second digital accumulator means for accumulating coordinate values having a second integer portion and a second fractional portion, said second integer portion providing a



signal representative of said second coordinate of each said point of said vector, said second fractional portion having a least significant bit, and

first and second presetting means for presetting said first and second fractional portions, respectively, to a value of approximately one-half prior to generating said vector.

5,070,467

METHOD AND APPARATUS FOR COMBINATION INFORMATION DISPLAY AND INPUT OPERATIONS

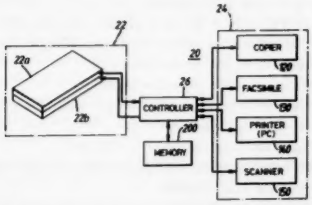
Tuyoshi Todome, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 458,344, Dec. 28, 1989, abandoned, which is a division of Ser. No. 170,429, Mar. 18, 1988, Pat. No. 4,937,762. This application Jun. 11, 1990, Ser. No. 535,976

Claims priority, application Japan, Mar. 19, 1987, 62-66969; Mar. 24, 1987, 62-70953

Int. Cl.[5] G06F *3/033*

U.S. Cl. 395—166 **3 Claims**



1. A method for generating control signals for combination equipment including a plurality of information processing modules having independent functions, the information processing modules including a plurality of operation modes, comprising the steps of:

loading an initial program from memory associated with an information processing module;

simultaneously generating a plurality of mode graphic display images on a display device, including a first one of the mode graphic display images identified to represent the loaded program;

responding to a touch input at a first position on an input device superposed with the display device, the first position being defined by X,Y coordinates associated with a second mode graphic display image, by loading a subsequent program from memory associated with a second information processing module of the equipment corresponding to the second mode graphic display image;

generating a second graphic display image defined by the subsequent program; and

responding to a touch input exclusively at a second position on the input device defined by the subsequent program, the second position being defined by X,Y coordinates associated with the second graphic display image, by generating a third graphic display image and by generating control signals to the second information processing module to execute an operation mode of the second information processing module.

5,070,468

PLANT FAULT DIAGNOSIS SYSTEM

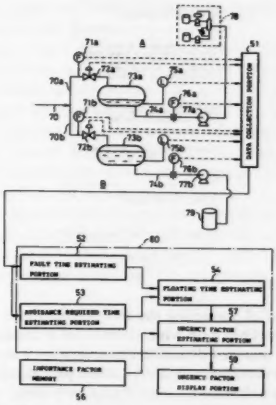
Toshihiko Niinomi, Hiroshima; Ryohei Funakoshi, Tokyo; Shigeru Kaseda, and Koichi Takahashi, both of Chita, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Idemitsu Kosan Company Limited, both of Tokyo, Japan

Continuation of Ser. No. 270,356, Nov. 14, 1988, abandoned. This application Oct. 12, 1990, Ser. No. 598,770

Claims priority, application Japan, Jul. 20, 1988, 63-96201; Jul. 20, 1988, 63-96202; Jul. 20, 1988, 63-96203; Oct. 3, 1988, 63-250596

Int. Cl.[5] G06F *11/32*

U.S. Cl. 364—550 **14 Claims**



1. A plant fault diagnosing system, comprising: instrumentation means for providing process data representing physical operational characteristics of a plant process, diagnosing means for diagnosing faults in the plant in accordance with a relationship between said process data and at least one of predetermined information regarding fault diagnosis and a changeable reference value based on said process data, said diagnosing means including means for generating a diagnosing pattern which symbolically represents said process data;

means for displaying the diagnosis given by said diagnosing means;

a memory for storing said predetermined information and also for outputting said predetermined information to said diagnosing means, said predetermined information including importance factors which define the relative importance of the diagnosed faults;

said diagnosing means including means for estimating a first amount of time which will elapse between the diagnosis and the actual occurrence of each fault based upon the physical properties of the plant process and said process data, means for estimating a second amount of time required to avoid the occurrence of the fault, means for subtracting said second amount of time from said first amount of time to thereby calculate an estimated floating time available before a fault avoidance operation should begin, and means for calculating an urgency factor based

on said estimated floating time and said importance factor; and

said displaying means including means for ranking and displaying the faults in sequential order based upon respective magnitudes of said urgency factor and said floating time.

5,070,469

TOPOGRAPHY SIMULATION METHOD

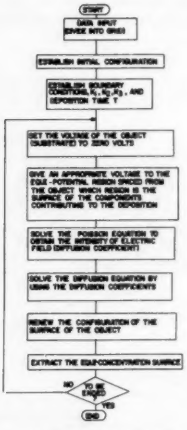
Tatsuya Kunikiyo; Masato Fujinaga, and Norihiko Kotani, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Sep. 21, 1989, Ser. No. 410,627

Claims priority, application Japan, Nov. 29, 1988, 63-302857; Apr. 19, 1989, 1-99477

Int. Cl.[5] G06F *15/72*

U.S. Cl. 364—578 **2 Claims**


START
DATA INPUT DEVICE INTO SIMS
ESTABLISH INITIAL CONFIGURATION
ESTABLISH BOUNDARY CONDITIONS, K_1, K_2, K_3, AND DEPOSITION TIME T
SET THE VOLTAGE OF THE OBJECT (SUBSTRATE) TO ZERO VOLTS
GIVE AN APPROPRIATE VOLTAGE TO THE EQUI-POTENTIAL REGION SPACED FROM THE OBJECT WHICH REGION IS THE SURFACE OF THE COMPONENTS CONTRIBUTING TO THE DEPOSITION
SOLVE THE POISSON EQUATION TO OBTAIN THE INTENSITY OF ELECTRIC FIELD DIFFUSION COEFFICIENT
SOLVE THE DIFFUSION EQUATION BY USING THE DIFFUSION COEFFICIENTS
RENEW THE CONFIGURATION OF THE SURFACE OF THE OBJECT
EXTRACT THE EQUI-CONCENTRATION SURFACE
NO
YES
END

1. A method of predicting the three-dimensional shape of a surface of a workpiece on which a material is deposited by the transport of a material deposition species from a source to the surface of the workpiece in a deposition process comprising:

establishing a three-dimensional grid of points;

specifying an initial three-dimensional shape of a surface of a workpiece on which a material will be deposited at each point on the grid of points;

specifying the three-dimensional diffusion coefficient of the material deposition species that will be transported from a source to the surface of the workpiece;

specifying the initial concentration of the deposition species at the surface of the workpiece on which the material will be deposited;

specifying the time T during which the material will be deposited on the workpiece; and

successively solving the three-dimensional diffusion model equations for each of a plurality of time intervals representing deposition of the material on the workpiece beginning from the specified initial three-dimensional shape of the surface of the workpiece at the beginning of the first interval, the initial deposition species concentration, and the three-dimensional diffusion coefficient of the deposition species at each point on the grid of points to determine the shape of the surface of the workpiece on which the material is deposited at the end of each interval from the shape of the surface of the workpiece on which the material is deposited at the beginning of that interval until the total length of the time intervals reaches the specified time T, thereby producing the final shape of the deposited surface after the deposition process has continued for the time T.

5,070,470

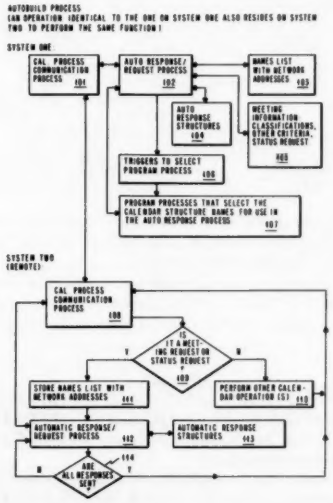
METHODS FOR HANDLING CALENDAR INFORMATION IN A DATA PROCESSING SYSTEM

Keith J. Scully, Austin, Tex., and Harinder S. Singh, Chapel Hill, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1987, Ser. No. 136,168

Int. Cl.[5] G06F *15/40*

U.S. Cl. 364—705.08 **9 Claims**


AUTOBUILD PROCESS
(AN OPERATION IDENTICAL TO THE ONE ON SYSTEM ONE ALSO RESIDES ON SYSTEM TWO TO PERFORM THE SAME FUNCTION)
SYSTEM ONE
CAL PROCESS COMMUNICATION PROCESS 101
AUTO RESPONSE/ REQUEST PROCESS 102
NAMES LIST WITH NETWORK ADDRESSES 103
AUTO RESPONSE STRUCTURES 104
MEETING INFORMATION CLASSIFICATIONS, OTHER CRITERIA, STATUS REQUEST 105
TRIGGERS TO SELECT PROGRAM PROCESS 106
PROGRAM PROCESSES THAT SELECT THE CALENDAR STRUCTURE NAMES FOR USE IN THE AUTO RESPONSE PROCESS 107
SYSTEM TWO (REMOTE)
CAL PROCESS COMMUNICATION PROCESS 108
IT A MEETING REQUEST OR STATUS REQUEST 109
Y
N
STORE NAMES LIST WITH NETWORK ADDRESSES 111
PERFORM OTHER CALENDAR OPERATION (S) 110
AUTOMATIC RESPONSE/ REQUEST PROCESS 112
AUTOMATIC RESPONSE STRUCTURES 113
ARE ALL RESPONSES SENT 114
N
Y

1. In a data processing system including a network of interactive workstations, a method of relating calendar information being maintained within said system, as represented by data of at least one calendar of a first individual user of said system comprising:

establishing in said data processing system by a second user, a first data structure which includes calendar information relating to a status of said at least one calendar, said information including the parameters of:

an identification of a calendar event;

a tentative or definite status for said calendar event;

a priority for said calendar event;

a time span for said calendar event; and

a list of names associated with a plurality of calendars being maintained on said system;

first comprising, by said data processing system, a security level of said second user with a security level of said an owner of said at least one calendar;

second comparing, by said data processing system and in response to said first comparing, said calendar information in said first data structure with said data of said at least one calendar;

automatically generating, by said data processing system and in response to said second comparing, of said at least one calendar as regards said calendar information in said first data structure;

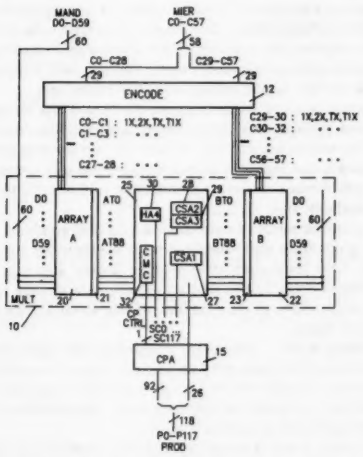
transmitting said second data structure to said second user to confirm said status of said at least one calendar;

enabling an automatic scheduling of an event in said at least one calendar in response to said status by transmitting a trigger, which is a reminder of said calendar event, at a designated time selected by said second user to selected other users who maintain calendars on said data processing system.

5,070,471
HIGH SPEED MULTIPLIER WHICH DIVIDES MULTIPLYING FACTOR INTO PARTS AND ADDS PARTIAL END PRODUCTS

Son Dao-Trong, Stuttgart; Klaus J. Getzlaff, Schoenaich, and Klaus Helwig, Sindelfingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Feb. 9, 1990, Ser. No. 478,283
Claims priority, application European Pat. Off., Feb. 21, 1989, 89102956.3
Int. Cl.[5] G06F *7/52*
U.S. Cl. 364—760 **17 Claims**



1. A multiplier for multiplying a first digital operand with a second digital operand, comprising:

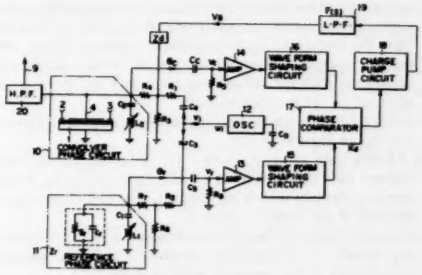
encoding means, coupled to said second operand, for identifying factors corresponding to groups of bits of said second operand according to an algorithm, and

multiplying means, coupled to said first operand and supplied with said factors created by said encoding means, for multiplying said first operand with said factors and adding partial end products resulting from the multiplications to yield an end product, said multiplying means comprising two multiplying arrays, each of said multiplying arrays being supplied with said first operand, and one of said multiplying arrays being supplied with the factors corresponding to the most significant bits of said second operand and the other one of said multiplying arrays being supplied with the factors corresponding to the least significant bits of the second operand, each of said multiplying arrays simultaneously multiplying said first operand with said corresponding factors and adding resultant partial products to yield a partial end product comprising sum bits and respective carry bits for at least some of said sum bits, each of said respective carry bits having corresponding significance to the respective sum bit and being derived from addition of next less significant bits, said multiplying means further comprising logic means, supplied with said partial end products for logically adding said sum bits and respective carry bits of said partial end products into said end product, said logic means including carry modifying means, supplied with a carry bit generated by one or more logical operations involving the most significant bit of the less significant partial end product and a sign generated by said other multiplying array, for influencing a next most significant bit of the end product based on said carry bit and said sign.

5,070,472
CONVOLVER OPTIMUM BIAS CIRCUIT

Hiroyuki Okagaki, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Aug. 29, 1989, Ser. No. 399,906
Claims priority, application Japan, Sep. 2, 1988, 63-221074
Int. Cl.[5] G06G *7/12*
U.S. Cl. 364—821 **11 Claims**



1. A convolver optimum bias circuit comprising:

an oscillator;

a divider circuit for dividing an output of said oscillator to first and second outputs;

a convolver phase circuit including a convolver having a gate electrode supplied from said first output of said divider circuit, and including a first inductive impedance connected between said gate electrode and ground;

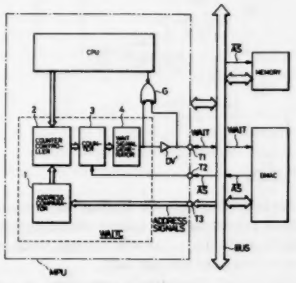
a phase comparator supplied with signals from said first and second outputs and responsive to the phase difference between said signals to provide a signal indicative of the magnitude of said phase difference; and

a charge pump circuit for converting said signal indicative of the magnitude of said phase difference into a DC bias and for applying said DC bias to bias said gate electrode in a direction towards maximum convolver gain.

5,070,473
MICROPROCESSOR

Makoto Takano, Tachikawa; Yasuhiko Hoshi, Fussa; Keiichi Kurakazu, Tachikawa, and Shiro Baba, Tokorozawa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., Tokyo, Japan

Filed Jul. 24, 1987, Ser. No. 77,442
Claims priority, application Japan, Aug. 22, 1986, 61-195455
Int. Cl.[5] G06F *13/12*
U.S. Cl. 395—725 **32 Claims**



1. A microprocessor comprising:

a central processor unit;

wait signal generating means for selectively generating a wait signal having a duration representative of a distinct

access time among at least first and second memory devices associated with the microprocessor;

a first operation interrupting means for interrupting operation of the central processor unit in accordance with the wait signal, the first operation, interrupting means being operatively connected with the central processing unit and the wait signal generating means;

a wait signal supplying means for supplying the wait signal from the wait signal generating means to an associated memory interface control device;

a second operation interrupting means for interrupting operation of the central processor unit in response to a signal from the associated memory interface control device, the second operation interrupting means being operatively connected with the central processor unit and an external terminal of the microprocessor;

monitoring means for monitoring memory address information on an associated bus;

an address data acquiring means for acquiring preselected address data representative of addresses for a one of the memory devices which has a data access rate slower than another of the memory devices;

comparison means in data communication with the monitoring means for comparing monitored memory address information to the acquired address data;

comparison signal generating means in data communication with the comparison means for generating a comparison signal in accordance with the comparing of the monitored memory address information with the acquired address data; and

the wait signal generating means being in data communication with the comparison signal generating means for selectively supplying the wait signal in accordance with the comparing of the monitored memory address information with the acquired address data.

5,070,474

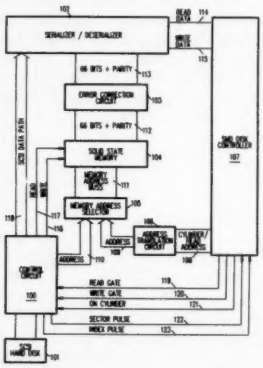
DISK EMULATION SYSTEM

George B. Tuma, Scotts Valley, Calif.; Wade B. Tuma, Reno, Nev., and Robert E. Warne, Markleeville, Calif., assignors to Disk Emulation Systems, Inc., Carson City, Nev.

Filed Jul. 26, 1988, Ser. No. 224,530

Int. Cl.[5] G06F *12/00*

U.S. Cl. 395—500 **82 Claims**



1. A data storage subsystem for storing and retrieving data used by a central processor, said subsystem comprising:

a disk emulator including a volatile storage medium having data storage locations therein; and

disk controller means, operatively connected to said central processor and to said disk emulator, for controlling data storage and retrieval from said disk emulator, wherein;

said disk controller means (i) specifies the location within said volatile storage medium where data is to be stored and from which stored data is to be retrieved, by means of geometric address information, (ii) provides to said disk emulator a serial data stream comprised of bits of data to be stored in said volatile storage medium, (iii) accepts stored data from said disk emulator as a serial data stream comprised of bits of data, and (iv) provides control signals to said disk emulator; and said disk emulator further comprises:

serializer/deserializer means, operatively coupled to said disk controller means, for (i) receiving said serial data from said disk controller means and providing parallel data on data lines, and (ii) receiving parallel data on said data lines and providing serial data to said disk controller means;

temporary data storage means, operatively coupled to said serializer/deserializer data lines and to said volatile storage medium, for receiving data input signals and subsequently generating data output signals, said temporary data storage means having a control input line;

wherein in a first mode of operation of said disk emulator, said parallel data signals from said serializer/deserializer means, are provided to said temporary data storage means and said data output signals from said temporary data storage means are provided to said volatile storage medium; and

in a second mode of operation of said disk emulator, data signals from said volatile storage medium are provided to said temporary data storage means and said data output signals from said temporary data storage means are provided to the data lines of said serializer/deserializer means;

addressing means, operatively coupled to said disk controller means, for generating an address signal for a specified location in said volatile storage medium in response to a first control signal and said geometric address information from said disk controller means;

data storage control means, operatively coupled to said disk controller means, to said serializer/deserializer means, to said control input line of said temporary data storage means, to said volatile storage medium, and to said addressing means, for (i) selectively connecting said parallel data signals of said serializer/deserializer means to said temporary data storage means, and (ii) selectively connecting said data output signals of said temporary data storage means to said specified location in said volatile storage medium in response to said address signal and a second control signal from said disk controller means; and

data retrieval control means, operatively coupled to said control input line of said temporary data storage means, to said serializer/deserializer means, to said volatile storage medium, to said addressing means, and to said disk controller means, for (i) selectively connecting said temporary data storage means to said specified location in said volatile storage medium in response to the address signal from said addressing means, and (ii) selectively connecting said temporary data storage means to said data lines of said serializer/deserializer means in response to a third control signal from said disk controller means.

5,070,475

FLOATING POINT UNIT INTERFACE

Kevin B. Normoyle, Boston; James M. Guyer, Northboro, both of Mass.; Rainer Vogt, Raleigh, N.C., and Anthony S. Fong, Southboro, Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Nov. 14, 1985, Ser. No. 797,856

Int. Cl.[5] G06F *13/00*

U.S. Cl. 395—375 **12 Claims**

1. A data processing system which includes a central processor unit (CPU) and a floating point unit (FPU) for making floating point computations wherein said CPU comprises

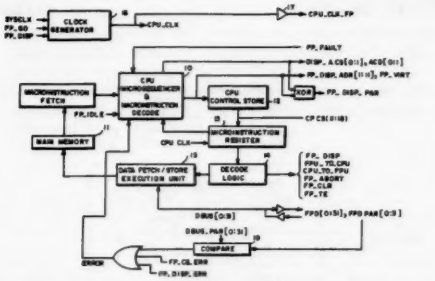
means for decoding a floating point macroinstruction to

provide a starting microinstruction address for use by said FPU to produce a sequence of FPU microinstructions;

means for supplying a dispatch control signal to inform the FPU that the CPU is about to execute said floating point macroinstruction;

means for supplying a dispatch address which includes a starting microinstruction address of a decoded macroinstruction to said FPU during the same operating cycle that said dispatch control signal is supplied to said FPU;

said FPU comprises



buffer memory means for storing the dispatch address of one decoded macroinstruction received from said CPU while a sequence of microinstructions of a dispatch address previously received by said FPU and previously stored in said buffer memory means is being executed by said FPU; and

further wherein said CPU further includes means for providing a first data transfer control signal for informing the FPU that data is being transferred to the FPU from said CPU and for providing a second data transfer control signal for informing the FPU that data is being transferred to the CPU from said FPU.

5,070,476

SEQUENCE CONTROLLER

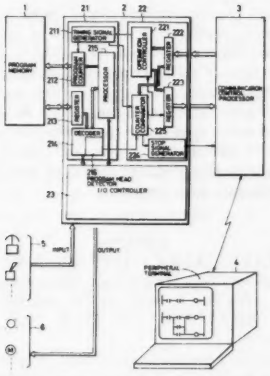
Katsuhiro Fujiwara, Sakurashi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 6, 1988, Ser. No. 178,198

Claims priority, application Japan, Apr. 7, 1987, 62-83802

Int. Cl.[5] G06F *15/46*

U.S. Cl. 395—575 **38 Claims**



1. A sequence controller for effecting a sequence processing depending upon an input condition according to a program which sends a control result to a system to be controlled, said sequence controller comprising:

memory means for storing a sequence program including plural occurrences of a particular code;

processor means for executing said sequence program stored in said memory means on the basis of input condition signals received from said system to produce control signals for control of objects in said system to be controlled;

reading means connected to said memory means for reading said sequence program including said particular code from said memory means and for supplying said sequence program to said processor means;

counting means connected to said reading means for counting occurrences of said particular code read by said reading means to produce a first value indicating a number of said particular code read by said reading means;

input means for inputting a second value indicating a number of occurrences of said particular code to be read out from said memory means; and

comparator means connected to said input means and said counting means for comparing said first value with said second value and for producing a control signal to control said input means and processor means to stop said sequence processing by said processor means when said first value reaches said second value.

5,070,477

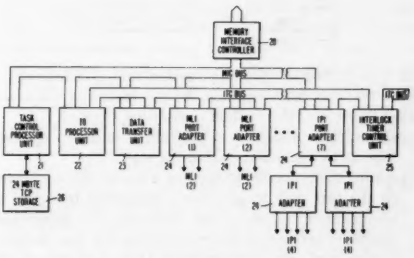
PORT ADAPTER SYSTEM INCLUDING A CONTROLLER FOR SWITCHING CHANNELS UPON ENCOUNTERING A WAIT PERIOD OF DATA TRANSFER

Farrukh A. Latif, Malvern, and Michael D. Stevens, Fraser, both of Pa., assignors to Unisys Coporation, Detroit, Mich.

Continuation of Ser. No. 37,670, Apr. 13, 1987, abandoned. This application Mar. 23, 1989, Ser. No. 328,807

Int. Cl.[5] G06F *13/12, 13/18*

U.S. Cl. 395—325 **6 Claims**



1. In a data processing system having a memory, a plurality of peripheral devices and an I/O system coupled to said memory and to said peripheral devices for controlling the transfer of data therebetween, the improvement comprising a port adaptor within said I/O system for transmitting data between said memory and said peripheral devices, said port adaptor comprising:

memory interface means coupled to said memory; first and second channels coupled between said memory interface means and said peripheral devices, each channel being coupled to a different peripheral device; and

control means including a control store for storing control sequences and sequencing means responsive to said control sequences for controlling and performing said data transfers between said memory interface means and said channel means, said sequencing means permitting only one channel to operate at a time using a control sequence applicable to the currently operable channel;

said control store containing control sequences applicable to respective ones of said channels wherein respective control sequences applicable to said channels include wait

periods occurring during data transfer operations which the respective channel waits on until the happening of one or more events,

said control means being responsive to system interrupt messages from said I/O system for providing concurrent data transfers between said memory interface means and selected peripheral devices via said channels by providing for switching operation from one channel to the other in response to encountering a wait period during the performance of a data transfer operation for said one channel,

said sequencing means operating in response to the occurrence of a wait period encountered while performing a control sequence for one channel to alternate its operation to the performance of a control sequence for the other channel, whereby said sequencing means can provide concurrent data transfer operations for said channels to different peripheral devices.

5,070,478

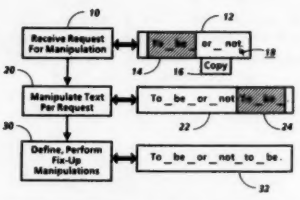
MODIFYING TEXT DATA TO CHANGE FEATURES IN A REGION OF TEXT

Curtis Abbott, Menlo Park, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 21, 1988, Ser. No. 274,261

Int. Cl.[5] G06F *15/401, 15/38*

U.S. Cl. 364—419 **47 Claims**



15. The method of operating a system that includes a processor and text data defining a text, the text including a first word having a first end; the method comprising steps of:

operating the processor to perform a selection operation relating to a selection within the text;

operating the processor to perform a manipulation operation on the text data to produce manipulated text data and manipulation operation data indicating the manipulation operation performed, the manipulated text data defining a manipulated text, the manipulated text including the first word and a first set of at least one punctuational feature in a region at the first end of the first word; the first set of at least one punctuational feature being incorrect;

automatically operating the processor to use the manipulated text data and the manipulation operation data to obtain operation-defining data defining a sequence of at least one operation on the manipulated text data that would modify the manipulated text data to correct the first set of at least one punctuational feature; and

in response to the operation-defining data, automatically operating the processor to perform a sequence of at least one operation defined by the operation-defining data on the manipulated text data, the sequence modifying the manipulated text data to produce modified text data defining a modified text, the modified text including the first word and a second set of at least one punctuational feature in a region at the first end of the first word, the second set of at least one punctuational feature being different than the first set of at least one punctuational feature; the second set of at least one punctuational feature being correct.

5,070,479

EXTERNAL MEMORY HAVING AN AUTHENTICATING PROCESSOR AND METHOD OF OPERATING SAME

Katsuya Nakagawa, Kusatsu, Japan, assignor to Nintendo Company Limited, Kyoto, Japan

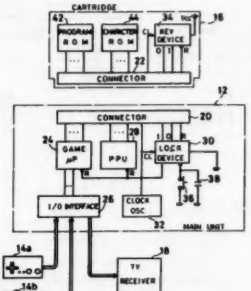
Division of Ser. No. 812,929, Dec. 23, 1985, Pat. No. 4,799,635. This application Jan. 13, 1989, Ser. No. 297,105

Claims priority, application Japan, Jun. 24, 1985, 60-138699; Jun. 28, 1985, 60-143026

The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.

Int. Cl.[5] G11B *23/28*

U.S. Cl. 395—575 **64 Claims**



1. An external memory unit for removable connection to a main video game data processor unit having a video game processing means for executing videographics programs stored in said external memory unit, said video game processing means being capable of being reset, and a dedicated authenticating processing means for executing a first predetermined authenticating program to form an information processing apparatus, said external memory unit comprising:

means for storing a videographics program that is to be executed by said video game processing means;

external authenticating processing means for operating in accordance with a second predetermined authenticating program when said memory unit is connected to the video game data processor unit for verifying that said videographics program stored in said means for storing is authorized for execution by said video game processing means;

means, coupled to said external authenticating processing means and said means for storing, for connecting said external memory unit to said video game data processor unit; and

wherein said external authenticating processor means includes data transfer means coupled to said means for connecting for transferring data related to the results of the execution of said second authenticating program to said dedicated authenticating processing means, whereby the video game processor means in said main video game processor unit is reset unless the results of the execution of the second authenticating program exhibit a predetermined relationship with the results of the first predetermined authenticating program.

5,070,480

NONVOLATILE ASSOCIATIVE MEMORY SYSTEM

John M. Caywood, 1410 Wright Ave., Sunnyvalle, Calif. 94087

Filed Jan. 8, 1990, Ser. No. 462,160

Int. Cl.[5] G11C *7/00, 15/00, 16/00*

U.S. Cl. 365—49 **23 Claims**

7. An associative memory system for comparing an applied signal having N digits, each having three possible states, one such digit being termed a trit, to M stored words of N trits each, and in response providing output signals indicative of the

correlation of the applied signal with the stored words, the memory comprising:

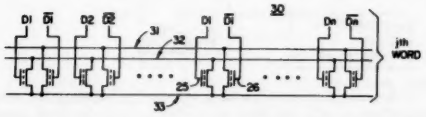
an M row by N column array of memory cells in which each row of N memory cells represents one word of N trit length and each column of M memory cells represents the same trit in each of the M words;

each of the memory cells including first and second semiconductor memory devices each capable of being placed in one of two states, and each memory device having a control electrode, an output electrode and a common electrode;

means interconnecting the control electrodes of the first semiconductor memory devices in memory cells which are in the same column;

means interconnecting the control electrodes of the second semiconductor memory devices in memory cells which are in the same column;

means interconnecting the common electrodes of the semiconductor memory devices the memory cells which are in the same row;



means interconnecting the output electrodes of the first semiconductor memory devices of the memory cells which are in the same row;

means interconnecting the output electrodes of the second semiconductor memory devices of the memory devices which are in the same row;

input means for applying a signal to be compared to the control electrodes of the first and second semiconductor memory device of each memory cell indicative of the state of a corresponding portion of the applied signal to be compared with the stored word;

means for applying an interrogation signal to the common electrodes of the semiconductor memory devices in each row of the memory cells; and

means for obtaining an output signal from the output electrodes of the memory devices in each row of the memory cells indicative of a correlation of the ternary word stored in that row and the applied signal at the time of application of the interrogation signal.

5,070,481

COORDINATED CIRCUIT FOR SUPPLYING POWER FROM A D-C SOURCE TO A MICROCOMPUTER AND ITS SEMICONDUCTOR MEMORIES

Georg Haubner, Berg, and Hartmut Zöbl, Fürth, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 5, 1986, Ser. No. 893,494

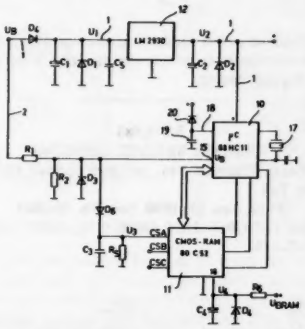
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1985, 3529494

Int. Cl.[5] H03K *1/14;* **G06F** *13/00*

U.S. Cl. 365—228 **3 Claims**

1. A supply voltage network for supplying a microcomputer (10) and at least one memory (11) with energizing voltage derived from a d-c source having a fluctuating output and subject to occasional disconnection from said network, said network also serving for assuring that any data statement, for which a transfer from said microcomputer to said at least one memory has actually begun before recognition by said microcomputer of said disconnection, will be completely written into said at least one memory before said at least one memory becomes disabled, said microcomputer including means for cyclical interrogation of a value representative of voltage received from said d-c source in order to recognize the appearance of said disconnection or of an equivalent battery failure, and said at least one memory having a write-in enabling input for enabling writing into said at least one memory only for a period after application of a voltage exceeding an upper threshold voltage until the applied voltage falls below a lower threshold voltage, said network comprising:

first means, including a first capacitor (C_3) for maintaining an enabling voltage (U_3) at said write-in enabling input (CSA) of said at least one memory which is not less than said lower threshold voltage for a first period (T_4–T_0) following said disconnection, said first period (T_4–T_0) being not less than the sum of a minimum interval (ΔT) required for completing a transfer to said at least one memory of a data statement after initiation of said transfer and a maximum interval (T_3–T_0) required after said disconnection for said microcomputer to recognize said disconnection by fall-off of voltage (U_B) supplied by said d-c source prior to said disconnection;



second means, including a second capacitor (C_2), for maintaining operating voltage (U_2) of the operation in said microcomputer (10) necessary for said cyclical interrogation and for transfer of data to said at least one memory (11) at a value not less than a predetermined mimimum operating voltage (U_{2min}) therefore for a second period ending after, or at the same time as, said first period (T_4–T_0) for which said enabling voltage (U_3) at said write-in enabling input is maintained by said first means at a value not less than said lower threshold voltage, and

third means, including at least a third capacitor (C_4) for maintaining operating voltage (U_4) for said at least one semiconductor memory (11) at a value not less than a predetermined minimum operating voltage therefore for a period ending after, or at the same time as, said first period (T_4–T_0) for which said enabling voltage is maintained by said first means at a value not less than said lower threshold voltage.

5,070,482

STATIC RANDOM ACCESS MEMORY

Fumio Miyaji, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 5, 1990, Ser. No. 505,157

Claims priority, application Japan, Apr. 6, 1989, 1-87591; Apr. 7, 1989, 1-88229

Int. Cl.[5] G11C *13/00*

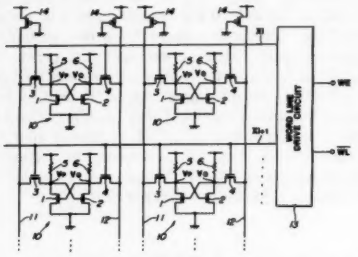
U.S. Cl. 365—230.06 **8 Claims**

1. A semiconductor memory device adapted for data writing and reading, comprising

a plurality of memory cells arranged in a matrix configuration, each memory cell including a pair of access transistors for row selection and a pair of drive transistors cross-coupled to each other to constitute a flipflop circuit, each said access transistor having a threshold voltage lower than the threshold voltage of said drive transistor,

a plurality of word lines connected to the gates of said access transistors of the memory cells for row selection,

a plurality of bit lines connected to said drive transistors of said memory cells by means of said access transistors to effect data writing or reading, and



word line drive means for driving said word lines so that said access transistors are at a lower impedance during writing than during reading.

5,070,483

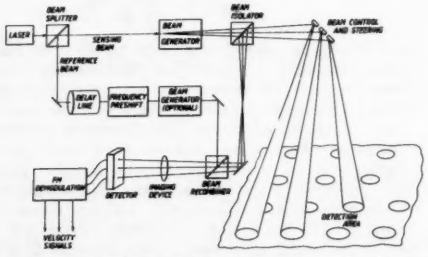
REMOTE SEISMIC SENSING

Albert J. Berni, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 12, 1990, Ser. No. 464,041

Int. Cl.[5] G01V *1/24*; G01B *9/02*; G01P *3/36*

U.S. Cl. 367—14 **9 Claims**



1. Apparatus for remotely measuring seismic signals at the surface of the earth, comprising:

a laser for producing a laser beam of substantially monochromatic frequency,

a beam splitter for splitting the laser beam into a sensing beam and a reference beam,

an optical modulator for changing the frequency of the reference beam to produce a predetermined frequency offset between the frequency of the sensing beam and the frequency of the reference beam,

a beam generating device for generating a preselected number of parallel sensing beams,

a beam control and steering device for individually directing each of the parallel sensing beams to preselected locations on the earth's surface,

a beam combining device located to intercept each reflected sensing beam and each reference beam and to individually combine an appropriate sensing and reference beam,

an imaging device for imaging said combined beams onto a detection plane,

a detector located at said detection plane for producing, at a frequency equal to the predetermined frequency offset, an individual beat signal varying in accordance with variations in the interference resulting from individually combining respective sensing and reference beams, and

means electrically connected to said detector for processing each individual beat signal to measure variations in its phase or amplitude and determined seismic signals therefrom.

5,070,484

SONIC DIRECTION LOCATING SYSTEM

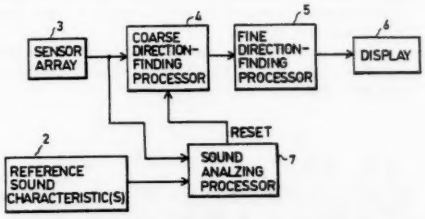
Juval Mantel, Inninger Strasse 7A, 8000 Munich 70, Fed. Rep. of Germany

Filed Sep. 20, 1990, Ser. No. 585,569

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1989, 3932620

Int. Cl.[5] G01S *3/80*

U.S. Cl. 367—124 **33 Claims**



1. A sonic direction locating system for locating the direction of origin of a specified type of sonic impulse with respect to a reference body, comprising:

a plurality of sonic sensors arranged in a predetermined array to be located at said reference body;

direction processing means for processing the outputs of said sonic sensors to determine the direction of a sonic impulse detected by the sonic sensors according to the positions in said array of the sonic sensors detecting the sonic impulse;

storage means for storing predetermined characteristics of the specified type of sonic impulse to be located;

sound analyzing means connected to receive the outputs of said sonic sensors for analyzing same for said predetermined characteristics thereof; and

disabling means for disabling the direction processing means immediately in response to a determination by the sound analyzing means that one of said predetermined characteristics of the detected sonic impulse does not correspond to that of the specified sonic impulse stored in said storage means.

5,070,485

LOW POWER MAGNETOSTRICTIVE SENSOR

David S. Nyce, Raleigh, N.C., assignor to MTS Systems Corporation, Minneapolis, Minn.

Filed Sep. 28, 1990, Ser. No. 589,680

Int. Cl.[5] G01S *15/08*

U.S. Cl. 367—127 **9 Claims**

1. A magnetostrictive transducer for generating an indication of a position along a gauge comprising:

a delay line;

pulse generator means for generating interrogation pulses on said delay line, in response to trigger pulse;

magnet means proximate said delay line, for converting interrogation pulses into acoustic pulses in said delay line, at the location of said magnet means;

mode converter means coupled to said delay line for converting said acoustic pulses into corresponding mode converter signals;

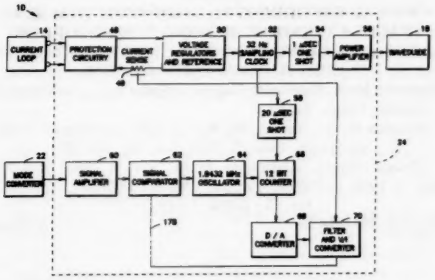
a sampling clock for generating repetitive trigger pulses;

blanking time means coupled to said sampling clock means for generation a blanking time interval, said blanking time interval initiated by said trigger pulse and extending for a predetermined time, said blanking timer blocking said mode converter signals during said predetermined tim;

conversion window timer means responsively coupled to said blanking timer for defining a conversion window time

period, whereby said conversion window time period begins at the expiration of said blanking time interval, and extends for a variable conversion time,

said conversion window timer means responsively coupled to said mode converter means, whereby said conversion window time period ends with the reception of said mode conversion signal;



a conversion clock for generating conversion pulses;

a conversion counter for counting said conversion pulses during said conversion window time period;

whereby the digital number in said conversion counter indicates the position of said magnet means along said gauge.

5,070,486

PROCESS TO INCREASE THE POWER OF THE LOW FREQUENCY ELECTRO ACOUSTIC TRANSDUCERS AND CORRESPONDING TRANSDUCERS

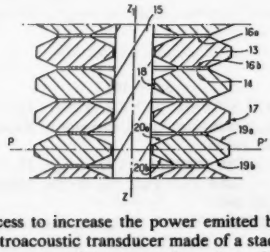
Didier Boucher, Six Fours les Plages, France, assignor to Et Francais, Paris, France

Filed Dec. 7, 1990, Ser. No. 629,650

Claims priority, application France, Dec. 7, 1989, 89 16172

Int. Cl.[5] H04R *17/00*

U.S. Cl. 367—155 **7 Claims**



1. A process to increase the power emitted by a low frequency electroacoustic transducer made of a stack of electroacoustic plates, comprising truncating edges of the plates so that contact surfaces of each plate with adjacent plates in the stack are reduced to two flat parts whose surface area is smaller than a maximum cross section area of each plate, an outline of a cross section of said truncated edges being symmetrical about a line in a plane of said maximum cross section area.

5,070,487

MAGNETO-OPTIC MEDIA RECORDING SYSTEM INCLUDING A DIRECTED MAGNETIC BIAS FLUX

Edwin G. Watson, Voorhees, N.J., assignor to General Electric Company, Camden, N.J.

Filed Jan. 31, 1990, Ser. No. 473,016

Int. Cl.[5] G11B *11/14, 5/127*

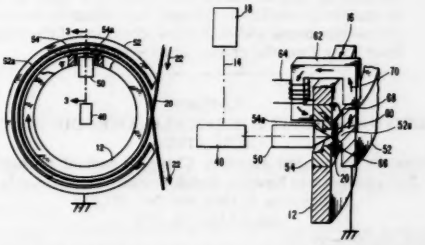
U.S. Cl. 369—13 **5 Claims**

1. In connection with a recording media in the form of an elongated flexible tape having first and second opposed surfaces, a system for providing a magnetic flux path from said first surface of said recording media to said second surface thereof for directing a magnetic field successively to different locations on said first surface, said system comprising in combination;

a cylindrical hollow nonmagnetic member around which a portion of said tape is wound in spiral fashion with said first surface being closer to said cylinder than is said second surface;

a first member of a magnetic material located in proximity to said second surface of said media comprising means in the shape of a semicircle surrounding at least a part of the circumference of said cylindrical member and said portion of said tape; and

a second member of magnetic material having a first terminus in proximity to said first surface of said media at a single location thereof and a second terminus in proximity to said first member, said second member comprising a



generally ring-shaped member of magnetic material having a generally central aperture therein and secured in an opening in said cylindrical member opposite said tape and said first member and further comprising a member of magnetic material which extends between said first member and said generally ring-shaped member;

a source of optical energy and means for directing the optical energy through said aperture in said generally ring-shaped member and onto the portion of tape located opposite said aperture and said ring-shaped member;

means for translating said second member relative to said media and first member so that said first terminus of said second member is successively relatively translated to said different locations on said media first surface; and

means providing a source of said magnetic flux and coupled to said second member for motion therewith;

whereby said magnetic field is successively directed to said different locations.

5,070,488

OPTICAL INTEGRATED CIRCUIT AND OPTICAL APPARATUS

Atsuko Fukushima, 1545, Yoshidacho, Totsuka-ku, Yokohama; Yasuo Hira, 1534-36, Sugetacho, Kanagawa-ku, Yokohama; Hidemi Sato, 3404-35, Nakatacho, Izumi-ku, Yokohama; Kazumi Kawamoto, 92-6, Torigaoka, Totsuka-ku, Yokohama; Kenchi Ito, 850, Maiokacho, Totsuka-ku, Yokohama; Masataka Shiba, 2-1-5-602, Royokuen-4-chome, Izumi-ku, Yokohama, and Akira Arimoto, 14-4, Nakajimacho, Kodaira-shi, all of Japan

Filed Jun. 28, 1989, Ser. No. 372,639

Claims priority, application Japan, Jun. 29, 1988, 63-159105; Jun. 5, 1989, 1-141015

Int. Cl.[5] G11B *7/00, 21/00*

U.S. Cl. 368—44.12 **24 Claims**

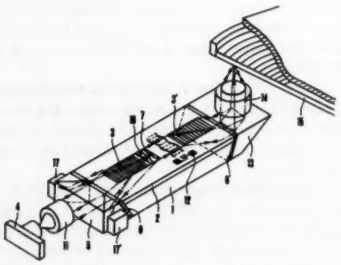
1. An optical apparatus comprising:

an optical waveguide disposed with respect to a surface of a substrate for propagating a laser beam therealong;

grating coupler means formed on the optical waveguide for enabling at least one of coupling of the laser beam to the optical waveguide as an input laser beam and coupling of

the laser beam from the optical waveguide as an output laser beam; and

aberration correction grating means disposed with respect to



the grating coupler means for enabling at least one of aberration correction of the input laser beam to the grating coupler means and aberration correction of the output laser beam from the grating coupler means.

5,070,489

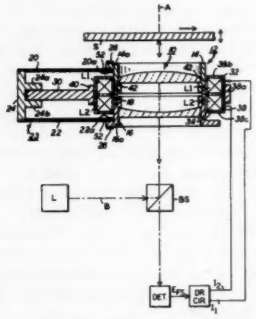
DRIVING CIRCUIT FOR DOUBLE SOLENOID FOCUS ACTUATOR

Stuart D. Perry, and Jasper S. Chandler, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 1, 1989, Ser. No. 387,733

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—44.16 **4 Claims**



1. A driving circuit for controlling the operation of an electromagnetic focus actuator, such actuator being adapted to control the focal position of a lens in response to a time-varying focus error signal indicating the instantaneous spacing between the lens and a desired focal plane, wherein said time-varying focus error signal is provided by a detector responsive to a difference between radiation focused on the desired focal plane and radiation currently impinging on the desired focal plane, such actuator comprising (i) a magnetizable member rigidly coupled to such lens, (ii) means for supporting such member and lens for movement along the lens axis, and (iii) a pair of electromagnetic coils surrounding the magnetizable member, such coils being adapted to produce, in response to current flowing therethrough, a time-varying magnetic field through the magnetizable member, such magnetic field being effective to control the movement of the magnetizable member and its associated lens along the lens axis, said driving circuit comprising:

a) a high-gain differential amplifier having first and second inputs and an output representing the difference between said inputs, one of said inputs being connected to said time-varying focus error signal;

b) a variable current source connected to the output of said differential amplifier, said current source being responsive to a polarity and amplitude of said amplifier output to control the current in either or both of said coils; and

c) circuit means for continuously detecting a difference in current flowing in said coils and for providing a time-varying control signal proportional to such current difference, said control signal being connected to said second input of said differential amplifier.

5,070,490

OPTICAL RECORDING MEDIUM WITH TRACKING TRACKS EXTENDING BEYOND THE RECORDING LAYER AND A METHOD FOR DETECTING TRACKING SIGNAL FROM SAID MEDIUM

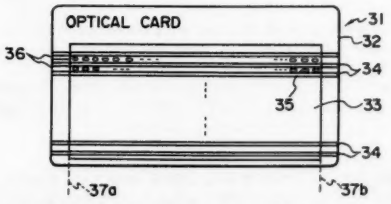
Kiyonobu Endo, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 33,789, Apr. 3, 1987, abandoned. This application Feb. 13, 1990, Ser. No. 479,205

Claims priority, application Japan, Apr. 9, 1986, 61-82928; Apr. 9, 1986, 61-82929; Aug. 12, 1986, 61-187854

Int. Cl.[5] G06K *7/015, 7/10*

U.S. Cl. 369—44.26 **6 Claims**



1. An optical recording medium comprising:

a card-like substrate comprising at least a recording surface;

a recording layer provided solely on an area of said recording surface and having a length in a longitudinal direction; and

a plurality of tracking tracks formed on said recording surface and extending parallel to one another, each of said tracking tracks having a length which is greater in the longitudinal direction than the length of said recording layer.

5,070,491

ERROR SIGNAL GENERATING CIRCUIT

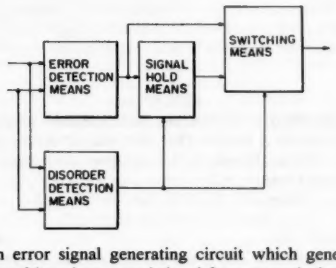
Kiyoshi Horie, Yokohama, Japan, assignor to Kabushiki Kaisha CSK, Tokyo, Japan

PCT No. PCT/JP88/00626, § 371 Date Apr. 21, 1989, § 102(e) Date Apr. 21, 1989, PCT Pub. No. WO88/10495, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 23, 1988, Ser. No. 329,789

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—44.34 **4 Claims**



1. An error signal generating circuit which generates an error signal based on a read signal from an optical recording medium, which circuit comprises:

an error detection means which receives the read signal and supplies an output of it as an error signal;

a disorder detection means having a summing amplifier which receives the read signal and also having a level comparator which checks the output level of the summing amplifier and detects a read disorder;

a signal hold means having a delay element for delaying the output from the error detection means for a predetermined time and a level hold circuit for holding an output level of the delay element and for holding an output of the error detection means which was present just before the read disorder state was detected and which the delay element outputs during a period when the output from the disorder detection means represents the disorderly state; and

a switching means to receive an output of the error detection means and to receive an output of the signal hold means to supply an output of the error detection means from the signal hold means which was present just before the disorderly state occurred upon receipt of the disorder detection means as a trigger when the output from the disorder detection means represents the existence of a disorderly state and the output from the error detection means when the output from the disorder detection does not represent the existence of a disorderly state.

5,070,492

SIGNAL DECODING APPARATUS AND METHOD

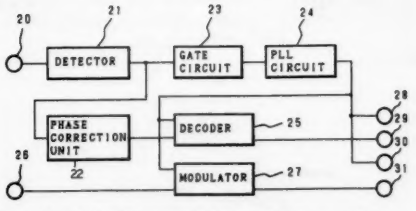
Masaharu Ogawa; Yoshiki Nakajima; Osamu Ito; Teruo Furukawa; Kyosuke Yoshimoto; Kunimaro Tanaka; Masafumi Ototake, and Minoru Ozaki, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1989, Ser. No. 317,197

Claims priority, application Japan, Mar. 3, 1988, 63-50136; Mar. 3, 1988, 63-50137; Mar. 3, 1988, 63-50138; Mar. 3, 1988, 63-50140

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—47 **7 Claims**



1. A signal decoding method for signals recorded on an optical disc, the optical disk having a header segment including a header servo area having at least one clock pit containing a clock signal and a track discrimination area having preformatted pits containing a track address signal, the optical disk further having a plurality of data segments each having a data servo area and a data area, each said data area including a plurality of recording pits containing data of the recorded signals, said method comprising;

reproducing signals from said recording pits and said preformatted pits to produce reproduced signals; and

decoding said reproduced signals obtained from said recording pits and said preformatted pits through a plurality of separate delay circuits each having a different delay time.

5,070,493

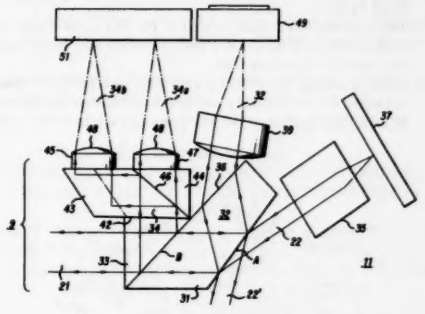
WEDGE PRISM ASSEMBLY FOR OPTICAL INFORMATION STORAGE

Daniel R. Marshall; David K. Campbell; Bernard W. Bell, Jr., and David K. Towner, all of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 22, 1989, Ser. No. 355,738

Int. Cl.[5] G11B *7/00*; G00J *1/20*

U.S. Cl. 369—112 **9 Claims**



1. an optical apparatus for recording information on an optical storage media and reproducing information therefrom comprising:

an optical assembly having a first optical surface and a second optical surface opposed to said first optical surface and defining an angle α therebetween;

a light source for generating a collimated light beam incident at an angle on said first optical surface;

said light beam passing through said first optical surface into said optical assembly and exiting said optical assembly at a first location on said second optical surface and passing to said media, the returned light beam reflected from said media being incident upon and passing through said second optical surface at said first location into said optical assembly and being incident upon and reflected from the internal side of said first optical surface to the inner side of said optical surface at a second location and exiting said optical assembly at said second location;

said angle α between said first and second optical surfaces being set at a pre-determined value for simultaneously controlling the anamorphic expansion ratio for said collimated light beam incident on the external side of said first opticals surface, the angle of reflection of said returned light beam, now the reflected returned light beam, from the internal side of said first optical surface, and the angel of incidence of the reflected returned light beam on the internal side of said second optical surface at said second location at substantially Brewster's Angle.

5,070,494

OPTICAL PICKUP DEVICE WITH DUAL-MODE DRIVE MECHANISM

Masami Emoto; Masanobu Nishimiya, and Akihiko Okamoto, all of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 3, 1989, Ser. No. 332,749

Claims priority, application Japan, Apr. 5, 1988, 63-83738; Apr. 8, 1988, 63-86350; Jul. 25, 1988, 63-185077; Jul. 27, 1988, 63-187580

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—112 **8 Claims**

1. An optical pickup device with a dual-mode drive mechanism for use selectively with a WORM (write-once-read-many) optical disc or an MO (magneto-optical) disc, comprising:

a semiconductor laser for emitting a laser light;

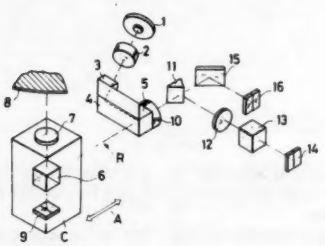
an objective lens for converging said laser light emitted by said laser on a recording medium to be reflected thereby as reflected light;

a photo-detector for receiving light reflected from the recording medium;

a beam splitter which is in an optical path of the emitted light and is between the laser and the objective lens and is in the path of the reflected light and is between the recording medium and the photo-detector and directs the reflected light to the photo-detector, said beam splitter reflecting 75% of s-polarized light and transmitting 99% of a p-polarized light;

a first quarter-wave plate which is in, and is mounted for rotation around, an optical path between said beam splitter and said objective lens;

a rotating means for rotating said first quarter-wave plate between: (i) a first rotary position in which an optical axis of said first quarter-wave plate is at an angle of 45° with



respect to a vibration direction of s-polarized light reflected from said beam splitter to thereby change s-polarized light reflected from the recording medium into circularly-polarized light and change circularly-polarized light reflected from the recording medium into p-polarized light in a case where said recording medium is a WORM optical disc; and (ii) a second rotary position in which said optical axis of said first quarter-wave plate matches said vibration direction to thereby change linearly-polarized light reflected from said recording medium into elliptically-polarized light in a case where said recording medium is an MO disc; and

a second quarter-wave plate which is between said beam splitter and said photo-detector and has an optical axis at right angle with respect to said vibration direction to change said elliptically-polarized light passed through said beam splitter into linearly-polarized light in said case where said recording medium is an MO disc.

5,070,495

WRITE CALIBRATION FOR MAGNETOOPTIC DISK RECORDERS

Warren L. Bletscher, Jr.; Julian Lewkowicz, and Morovat Tayefeh, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 12, 1989, Ser. No. 336,479

Int. Cl.[5] G11B *7/125, 7/00*

U.S. Cl. 369—116 **17 Claims**

1. In a machine-effected method of operating an optical disk player having an optical disk with a plurality of concentric tracks each of said tracks for serially storing data signals, radially-innermost and radially-outermost ones of the tracks, a laser system for impinging a light beam on the tracks for recording and reading data signals on and from any of said tracks, the laser system having laser operational parameters with adjustable values, one parameter being laser operation power level and a second parameter being duration of emitted light pulses;

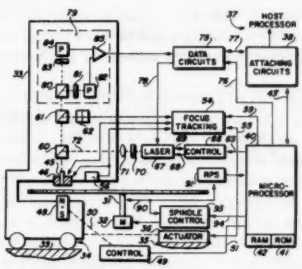
including the machine-executed steps of:

moving the light beam to one of the radially-innermost tracks;

at said radially-innermost track, calibrating the laser operation power level for recording data signals on said radially innermost one of the tracks such that readback of recorded signals on said radially-innermost one of said tracks exhibits a minimal synchronous noise level;

moving the light beam to a radially-innermost track;

calibrating the laser operation power level for recording data signals on said radially-innermost one of the tracks and adjusting the laser operation parameters until the readback of recorded signals on said radially-innermost one of said tracks exhibits a minimal synchronous noise



level, making the parameter values used to obtain said minimal synchronous noise readback calibrated laser operation parameters; and adjusting the laser operation power level for recording on tracks other than said radially-innermost and radially-outermost ones of the tracks by linearly interpolating or extrapolating the power levels based upon the radial position of such tracks relative to said radially-innermost and radially-outermost ones of the tracks and said calibrated power levels of said laser at said radially-innermost and radially-outermost ones of said tracks.

5,070,496

LASER REPRODUCING APPARATUS

Hiroshi Ogawa, and Hideyoshi Horimai, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

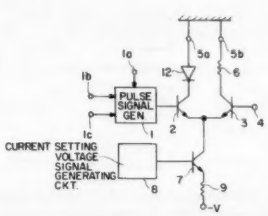
PCT No. PCT/JP88/00376, § 371 Date Dec. 12, 1988, § 102(e) Date Dec. 12, 1988, PCT Pub. No. WO88/08191, PCT Pub. Date Oct. 20, 1988

PCT Filed Apr. 15, 1988, Ser. No. 290,412

Claims priority, application Japan, Apr. 15, 1987, 62-92379

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—116 **13 Claims**



1. A laser reproducing apparatus for reproducing data recorded on a recording medium by the irradiation of a laser beam from a laser diode, in which the laser diode is activated by a drive current, and light from the laser diode is reflected back from the recording medium into the laser diode, comprising:

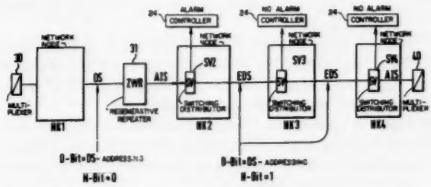
means for setting the drive current for activating said laser diode near a value at which the laser beam is altered the least by the reflected-back light; and

means for pulsing the irradiation of the recording medium by the laser beam from said laser diode at set current value intermittently at a predetermined cycle.

5,070,497
TRANSMISSION NETWORK WITH SWITCHABLE NETWORK NODES

Harald Kleine-Altekamp, Bietigheim, Fed. Rep. of Germany, assignor to Alcatel N. V., Netherlands

Filed Feb. 27, 1990, Ser. No. 486,555
Claims priority, application Fed. Rep. of Germany, Feb. 28, 1989, 3906334
Int. Cl.[5] H04L *12/26;* **H04J** *3/14;* **H04B** *3/46;* **G06F** *11/30*
U.S. Cl. 370—14.0 **7 Claims**



5. A transmission network, comprising:

switchable network nodes;

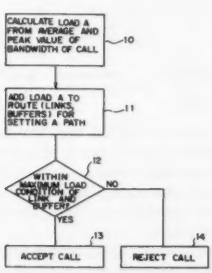
digital signal paths interconnecting said network nodes; and

a controller associated with each network node, said network nodes being operative for switching digital signal paths, the network nodes having input and output ports for digital signals, wherein all network nodes monitor their digital input signals as to whether they contain an alarm signal, a network node receiving an alarm signal provides an alarm to its associated controller, generates a substitute digital signal with a predetermined frame structure and passes it to the respective next network node instead of the received alarm signal, and inserts a bit indicating the released alarm into the substitute digital signal at a predetermined bit position, the network nodes receiving the substitute digital signal containing the bit indicating the released alarm pass said substitute digital signal on to subsequent network nodes and do not release an alarm, and a last network node of the digital path converts the received substitute digital signal into the alarm signal.

5,070,498
CALL CONTROL SYSTEM IN ATM SWITCH

Satoshi Kakuma; Atsuhisa Takahashi, and Yoshihiro Uchida, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 6, 1990, Ser. No. 563,210
Claims priority, application Japan, Aug. 4, 1989, 1-201444
Int. Cl.[5] H04Q *11/04*
U.S. Cl. 370—60 **20 Claims**



1. In an ATM switch which is used in an asynchronous transmission mode (ATM) digital network for providing various services including voice, data communications and motion images and comprises a plurality of self-routing modules each comprising a plurality of input links, a plurality of output links and buffers placed at respective intersections of said input links and said output links for storing ATM cells, a call control method comprising the steps of:

obtaining, when a call to be switched in said ATM switch is produced, a load representing how much of the capacity of said input and output links of said self-routing modules is used by said call from the average value and peak value of the bandwidth of said call;

adding said load to each of current load values of input links, output links and buffers of said self-routing modules which form a path set for said call in said ATM switch;

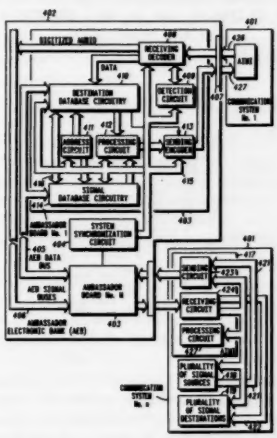
making a determination of whether or not each of the results of said addition exceeds a maximum value of said input links, said output links and said buffers forming said path; and

accepting said call when said maximum is not exceeded as a result of said determination.

5,070,499
COMMUNICATION SYSTEM INTERFACE MODULE FOR USE WITHIN A COMMUNICATION SYSTEM NETWORK

John W. Maher, Woodstock, and Stephen J. Ranz, Elmhurst, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 509,915, Apr. 16, 1990. This application Aug. 30, 1990, Ser. No. 574,716
Int. Cl.[5] H04J *3/02*
U.S. Cl. 370—61 **11 Claims**



1. A communication system network that comprises a plurality of communication systems, a processing multiplexer that comprises a plurality of communication system interface modules, a plurality of source interface buses, and a plurality of destination interface buses, wherein each of the plurality of destination interface buses comprises a plurality of TDM slots, wherein one of the communication system interface modules is operably coupled to at least one of the plurality of communication systems by at least one of the plurality of source interface buses and by at least a first destination interface bus and a second destination interface bus of the plurality of destination interface buses, and wherein each of the communication system interface modules comprises:

processing means for processing audio information generated by at least one of the plurality of communication systems to produce processed audio information;

buffer means, operably associated with the processing means, for temporarily storing at least a first part of the processed audio information that is destined for the first destination interface bus in a first buffer location and for temporarily storing at least a second part of the processed

audio information that is destined for the second destination interface bus in a second buffer location;

multiplexer means, operably associated with the buffer means, for alternatively routing, in a cyclic manner throughout a frame cycle, a portion of the at least a first part of the processed audio information stored in the first buffer location to a TDM slot of the first destination interface bus during a first interval of a frame cycle and routing a portion of the at least a second part of the processed audio information stored in the second buffer location to a TDM slot of the second destination interface bus during a second interval of the frame cycle; and

buffer address means, operably associated with the buffer means, for generating addresses such that the first buffer location is addressed during the first interval of the frame cycle and the second buffer location is addressed during the second interval of the frame cycle, wherein each of the first buffer location and the second buffer location is addressed on alternate intervals of the frame cycle in a cyclic manner throughout the frame cycle.

5,070,500

MEMORY PACKAGE SYSTEM UTILIZING INDUCTIVE COUPLING BETWEEN MEMORY MODULE AND READ/WRITE UNIT

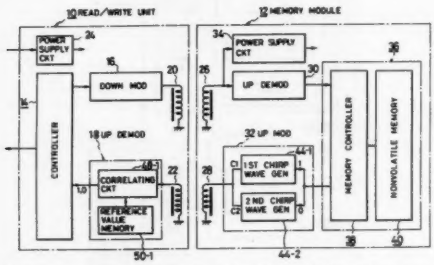
Shinichi Horinouchi, Yokohama, and Kunihiko Takeuchi, Kawasaki, both of Japan, assignors to Tokyo Keiki Company Ltd., Tokyo, Japan

Filed Aug. 1, 1989, Ser. No. 387,966

Claims priority, application Japan, Aug. 30, 1988, 63-215472; Aug. 30, 1988, 63-215474; Aug. 30, 1988, 63-215475

Int. Cl.[5] H04J *1/00*

U.S. Cl. 370—69.1 **16 Claims**



1. A memory package system in which a bidirectional transmission for a writing or reading operation of data is executed by a contactless inductive coupling between a memory module having therein a nonvolatile memory and a read/write unit, wherein:

(A) a pair of closely arranged induction coils for a down signal transmission are provided comprising a transmission coil of said read/write unit and a reception coil of said memory module, and a pair of closely arranged induction coils for an up signal transmission are provided comprising a transmission coil of said memory module and a reception coil of said read/write unit;

(B) said read/write unit comprises:

down modulating means, which uses said pair of induction coils for the down signal transmission, for operating in a writing mode to modulate data constructed of a write command, a write address and write data which are necessary to carry out a writing operation of said memory module and to transmit the thus modulated data, and for operating in a reading mode to modulate data constructed of a read command and a read address which are necessary to carry out a reading operation of the memory module and to transmit the thus modulated data, and

up demodulating means for demodulating read data from the modulation signal which is transmitted from said memory module by using said pair of induction coils for the up signal transmission;

(C) said memory module comprises:

down demodulating means for demodulating data which is necessary to write or read from the modulation signal transmitted from said down modulating means;

memory control means for allowing the data to be written into or be read out from said nonvolatile memory on the basis of the demodulation data obtained from said down demodulating means;

power source supply means for rectifying the modulation signal transmitted from said down modulating means and making an operating power source of the memory module, and

up modulating means for modulating the read data which was read out of the nonvolatile memory and transmitting to said read/write unit by using said pair of induction coils for the up signal transmission;

(D) said up modulating means comprises first spread spectrum waveform generating means for generating different spread spectrum waveforms in correspondence with bits 1 and 0 of the read data; and

(E) said up demodulating means comprises first correlation arithmetic operating means for demodulating the data bit **1** or **0** by correlation arithmetic operation of the reception signal received by said pair of induction coils for the up signal transmission and reference signals of the spread spectrum waveforms which have previously been stored.

5,070,501

TOKEN PASSING TYPE SLOTTED LOOP NETWORK SYSTEM WITH MEANS FOR ENABLING HIGH SPEED ACCESS CONTROL AND SIMPLE FRAME SLOT STRIPPING

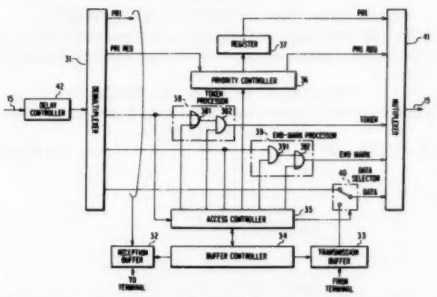
Hiroshi Shimizu, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 11, 1990, Ser. No. 535,619

Claims priority, application Japan, Jun. 9, 1989, 1-147541; Jun. 9, 1989, 1-147542; Jul. 14, 1989, 1-183051

Int. Cl.[5] H04J *3/00;* **H04Q** *11/04*

U.S. Cl. 370—85.4 **9 Claims**



1. A token passing type slotted loop network system comprising a master node station and a plurality of slave node stations connected to each other to form a data transmission loop, a plurality of slots being circulated on said loop for transmitting a data signal from a particular one of the node stations having the token,

each of said slots having a fixed length and comprising:

a header portion comprising an end/non-end code section for carrying the end/non-end code, the end code and the non-end code representing an end and a non-end of transmission of the data signal; and

a data carrier portion for carrying the data signal,

each of said master and slave node stations comprising:

multiplexing means for multiplexing input signals applied

thereto to produce a multiplexed signal, said multiplexed signal being delivered therefrom to said loop;

transmissions buffer means for holding the data signal to be transmitted to said loop as a buffered data signal as one of said slots;

demultiplexing means for demultiplexing each of said slots sequentially incoming thereto as an incoming slot signal to produce said end/non-end code section and said data carrier portion of said incoming slot signal as a separated end/non-end signal and a separated data signal;

selecting means coupled to said demultiplexing means and said transmission buffer means for selecting said separated data signal at a repeating mode and said buffered data signal at a transmission mode as a selected signal, said selected signal being delivered to said multiplexing means as one of said input signals;

end-mark processing means coupled to said demultiplexing means for repeating said separated end/non-end signal to said multiplexing means as another one of said input signals at a repeating mode, said end-mark processing means producing a non-end code signal and an end code signal to deliver the non-end code signal and the end code signal to said multiplexing means as another one of said input signals at a non-end condition and an end condition, respectively; and

control means coupled to said demultiplexing means, said transmission buffer means, said selecting means and said end-mark processing means for controlling said end-mark processing means and said selecting means.

5,070,502

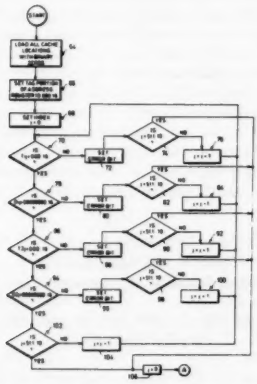
DEFECT TOLERANT SET ASSOCIATIVE CACHE

Robert M. Supnik, Carlisle, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 23, 1989, Ser. No. 370,469

Int. Cl.[5] G06F *11/20*

U.S. Cl. 371—11.1 **16 Claims**



7. A method of detecting hardware defects in a set-associative cache memory location and disabling defective cache memory locations from further use, comprising:

a) reserving a bit in each cache memory location;

b) testing each cache memory location for a defect;

c) setting said reserved bit in a tested cache memory location in response to a detected defect in said tested cache memory location;

d) inhibiting use of any cache memory location containing a set reserved bit;

e) testing the status of said reserved bit in an accessed cache memory location; and

f) using said cache memory location if said reserved bit is not set, and bypassing said cache memory location if said reserved bit is set.

5,070,503

DIGITAL INFORMATION TRANSMITTING AND RECEIVING SYSTEM

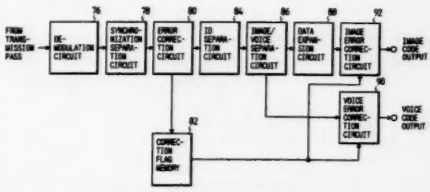
Akihiro Shikakura, Atsugi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 7, 1989, Ser. No. 320,089

Claims priority, application Japan, Mar. 9, 1988, 63-55538; Mar. 9, 1988, 63-55539; Mar. 9, 1988, 63-55540

Int. Cl.[5] G06F *11/00*

U.S. Cl. 371—37.1 **32 Claims**



20. A digital information transmitting and receiving system, comprising:

(A) a transmitter which includes

(a) a high efficiency encoding means for compressing main information of digital information codes using correlativity of a predetermined direction among said digital information codes, and outputting compressed main information codes;

(b) a sub-information code forming means for forming sub-information codes;

(c) error correcting code generating means for generating an error correcting code using said compressed main information codes and said sub-information codes; and

(d) transmitting means for transmitting a code train including said compressed main information codes, said sub-information codes, and said associated error correcting code; and

(B) a receiver which includes

(a) a receiving means for receiving said code train;

(b) error correcting means for correcting error codes of said compressed main information codes and said sub-information codes by using said error correcting code within said code train received by said receiving means, said error correcting means outputting an error flag representative of whether there is an uncorrectable code within said code train having a predetermined number of said compressed main information codes;

(c) first error modifying means for modifying an error code of said main information codes in units of said predetermined number of said compressed main information codes, in accordance with said error flag; and

(d) second error modifying means for modifying an error code of said sub-information codes from said error correcting means in units of a predetermined number of said sub-information codes smaller than the first mentioned predetermined number.

5,070,504

METHOD AND APPARATUS FOR PROVIDING ERROR CORRECTION TO SYMBOL LEVEL CODES

Douglas D. Bossen, Poughkeepsie; Chin-Long Chen, Wappingers Falls, and Mu-Yue Hsiao, Poughkeepsie, all of N.Y., assignors to International Business Machines, Armonk, N.Y.

Filed Jun. 23, 1989, Ser. No. 370,935

Int. Cl.[5] G06F *11/10*

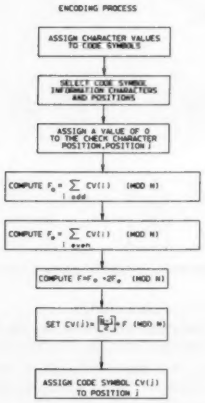
U.S. Cl. 371—54 **3 Claims**

1. A method for operating a computer device to correct a

received sequence of coded information symbols having one erasure, said sequence having been present on a physical medium, said method comprising the steps of:

setting an initial character value of position j. CV(j), where j denotes the sequence position of the erasure on said medium;

forming a sum, F_o, of preassigned character values associated with said information symbols on said medium, said sum being carried out for all sequence positions having an odd position number, said sum being carried out modulo N where N is odd and is also the number of code symbols;


ENCODING PROCESS
ASSIGN CHARACTER VALUES TO CODE SYMBOLS
SELECT CODE SYMBOL INFORMATION CHARACTERS AND POSITIONS
ASSIGN A VALUE OF 0 TO THE CHECK CHARACTER POSITION, POSITION I
COMPUTE $F_o = \sum_{i\ odd} CV(i)$ (MOD N)
COMPUTE $F_e = \sum_{i\ even} CV(i)$ (MOD N)
COMPUTE $F = F_o + 2F_e$ (MOD N)
SET $CV(j) = \left[\frac{N-1}{2}\right] \cdot F$ (MOD N)
ASSIGN CODE SYMBOL CV(j) TO POSITION j

forming a sum, F_e, of preassigned character values associated with said information symbols, said sum being carried out for all sequence positions having an even position number, said sum being carried out modulo N;

forming check sum F as $F_o + 2\ F_e$ modulo N;

computing the character value of the erasure position, CV(j), as $-F$ modulo N if j is odd and as $(N-1/2 \cdot F$ modulo N if j is even; and

associating a corrected eraser position information symbol with character value CV(j) in accordance with said preassigned character value association.

5,070,505

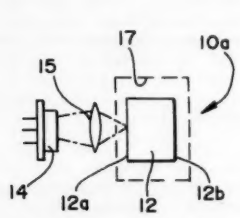
SELF-DOUBLING MICRO-LASER

George J. Dixon, Melbourne, Fla., assignor to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 516,459, Apr. 30, 1990. This application Jan. 7, 1991, Ser. No. 638,098

Int. Cl.[5] H01S *3/10*; H03F *7/00*

U.S. Cl. 372—22 **34 Claims**



1. A laser, comprising:

an active medium comprising a self doubling crystal which has two opposite faces;

laser diode source means for pumping said crystal; and

resonance means, associated with said faces, for resonantly enhancing and phase-matching laser light emitted by said crystal at a fundamental wavelength and at a harmonic of said fundamental wavelength, said resonance means having an output at said harmonic which is generally more reflective than transmissive.

5,070,506

HALIDE LASER GLASS AND LASER DEVICE UTILIZING THE GLASS

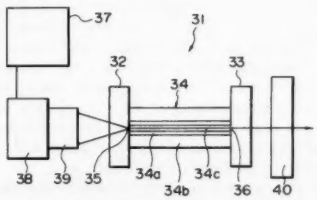
Hiroaki Yanagita, Hino, and Keiko Okada, Akishima, both of Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Sep. 24, 1990, Ser. No. 587,945

Claims priority, application Japan, Sep. 29, 1989, 1-254848; Aug. 22, 1990, 2-220534

Int. Cl.[5] H01S *3/17*

U.S. Cl. 372—40 **9 Claims**



1. Halide laser glass comprising cationic components and anionic components,

in which said cationic components are constituted by: Al ions; Zr ions and/or Hf ions; at least one kind of ions selected from the first group consisting of Ca ions, Sr ions and Ba ions; at least one kind of ions selected from the second group consisting of Mg ions, Y ions and alkali metal ions; and Er ions, said cationic components being present within the ranges: Al ions in a range of from 20 to 45 mol %, Zr ions and/or Hf ions in a range of from 0.5 to 25 mol %, Ca ions in a range of from 0 to 42 mol %, Sr ions in a range of from 0 to 25 mol %, Ba ions in a range of from 0 to 25 mol % in a total amount of the first group cations within the range of 20 to 70 mol %, Mg ions in a range of from 0 to 15 mol %, Y ions in a range of from 0 to 20 mol %, alkali metal ions in a range of from 0 to 20 mol % in a total amount of the second group cations within the range of 2 to 50 mol %, and Er ions in a range of from 6 to 25 mol %, and

in which said anionic components are constituted by F ions or F ions and Cl ions, said anionic components being present within the ranges: F ions in a range of from 90 to 100 mol %, and Cl ions in a range of from 0 to 10 mol %.

5,070,507

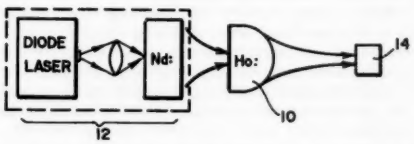
THREE MICRON LASER

Douglas W. Anthon, Wheaton, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Mar. 2, 1990, Ser. No. 487,537

Int. Cl.[5] H01S *3/16*

U.S. Cl. 372—41 **40 Claims**



1. A solid-state laser system operating in the three micron region, comprising:

a) pumping laser means characterized by a pumping wavelength at about 1.1 microns; and

b) holmium laser means which is pumpingly coupled to said pumping laser means for strong absorption at said pumping wavelength and which comprises a holmium lasant material having a holmium concentration in excess of 15 percent.

5,070,508

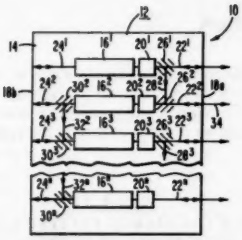
SEMICONDUCTOR LASER WITH ADJUSTABLE LIGHT BEAM

Jacob M. Hammer, Princeton Borough, N.J., assignor to General Electric Company, Schenectady, N.Y.

Filed May 7, 1986, Ser. No. 860,447

Int. Cl.[5] H01S *3/98*

U.S. Cl. 372—44 **22 Claims**



1. A semiconductor laser device comprising:

a substrate of semiconductor material having a major surface;

a plurality of laser elements in spaced relation along said major surface, each of said laser elements having a region which is substantially parallel to said major surface in which radiation is generated and surfaces substantially perpendicular to said region from which at least some of the generated radiation is emitted;

means along said major surface for optically coupling all of said laser elements in series so as to injection lock the respective phases of all of the laser elements to each other;

means for emitting a beam of at least some of the generated radiation from the laser elements from a surface of the substrate; and

respective electrically-adjustable optical phase-shifters, included in the means for optically coupling all of said laser elements in series, after at least some of said laser elements in said series, responding to respective electric signals applied thereto, to control the direction and lobe structure of said emitted beam.

5,070,509

SURFACE EMITTING, LOW THRESHOLD (SELTH) LASER DIODE

Mark M. Meyers, Hamlin, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 9, 1990, Ser. No. 564,930

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—45 **13 Claims**

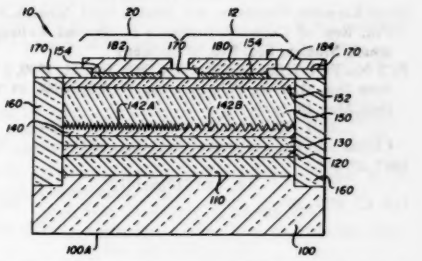
1. A surface emitting semiconductor laser diode structure formed on a substrate, the structure comprising:

a first section operable for wavelength tuning and an adjacent second section for effecting surface-emission of laser light, the first and second sections including:

an optical waveguide having an active layer for the generation of laser light and a separate confinement heterostructure (SCH) having plural heterojunctions operatively connected to the optical waveguide;

means for providing periodic variation in the refractive index of at least one of the surrounding heterojunctions to provide optical coupling of the laser light to the second section;

an index-guiding buried heterostructure operatively connected to the optical waveguide for partial confinement of the laser light; and



means operably connected to the second section for effecting current flow therethrough for inducing emission of laser light.

5,070,510

SEMICONDUCTOR LASER DEVICE

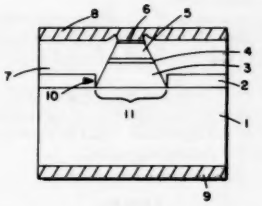
Fumihiro Konushi, Hirakata; Hiroshi Nakatu, Tenri; Kazuhiko Inoguchi, Nara; Toshiyuki Okumura, Tenri; Akinori Seki, Nara; Haruhisa Takiguchi, Nara; Chitose Nakanishi, Nara; Satoshi Sugahara, Nara, and Hiroaki Kudo, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Japan

Filed Dec. 10, 1990, Ser. No. 625,169

Claims priority, application Japan, Dec. 12, 1989, 1-323295; Jan. 22, 1990, 2-13333; Jan. 31, 1990, 2-22953; Jan. 31, 1990, 2-22954; Jan. 31, 1990, 2-22955; Apr. 4, 1990, 2-89634; Jun. 20, 1990, 2-162334

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—46 **16 Claims**



1. A semiconductor laser device comprising:

a semiconductor substrate;

a current blocking layer formed on said semiconductor substrate;

a channel formed in said current blocking layer, said channel reaching said substrate;

a mesa stripe having a multilayer structure and formed on said substrate within said channel, said multilayer structure including an active layer;

a burying layer covering the side faces of said multilayer structure;

wherein the main surface of said substrate is a (100) plane, said channel is oriented along the <011> direction, and said side faces of said multilayer structure are facets of {111} planes.

5,070,511

LASER ARRANGEMENT HAVING AT LEAST ONE LASER RESONATOR AND A PASSIVE RESONATOR COUPLED THERETO

Franz Kappeler, Puchheim, and Thomas Wolf, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

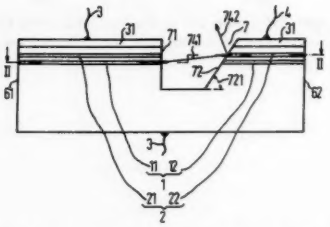
PCT No. PCT/DE88/00655, § 371 Date Jun. 21, 1990, § 102(e) Date Jun. 21, 1990, PCT Pub. No. WO89/04558, PCT Pub. Date May 18, 1989

PCT Filed Oct. 25, 1988, Ser. No. 477,941

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1987, 3738053

Int. Cl.[5] H01S *3/19*

U.S. Cl. 372—50 **4 Claims**



1. In a laser arrangement having at least one laser resonator and one passive resonator coupled thereto in a longitudinal direction that are monolithically integrated in a semiconductor layer structure, having:

an active layer for the laser resonator, a wave guide layer for the passive resonator, a trench that has a vertical side wall perpendicular oriented relative to the active layer and an oblique side wall inclined by an angle of inclination relative to the wave guide layer,

whereby the perpendicular side wall forms a mirror surface between the laser resonator and the passive resonator and the oblique side wall cuts the passive resonator, comprising:

the active layer and the wave guide layer arranged above one another;

the spacing between the active layer and the wave guide layer being such that no optical coupling through semiconductor material ensues between the active layer and the wave guide layer;

the angle of inclination of the oblique side wall dimensioned such that the radiation emerging from the active layer at the vertical side wall is not reflected back into the active layer; and

a width of the trench and the angle of inclination dimensioned relative to one another such that radiation from the active layer is coupled into a part of the wave guide layer located in the passive resonator.

5,070,512

INTERFERENCE FIT LASER DISK

Jeffrey L. Kaiser, Mountain View; David L. Wright; Denes A. Hegedus, both of Redwood City, and Alan B. Peterson, Palo Alto, all of Calif., assignors to Spectra-Physics, Inc., San Jose, Calif.

Filed Sep. 19, 1988, Ser. No. 228,285

Int. Cl.[5] H01S *3/03*

U.S. Cl. 372—65 **4 Claims**

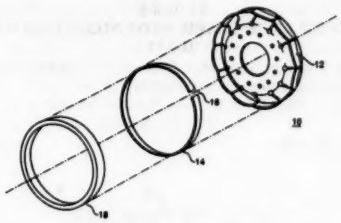
1. An interference-fit laser tube disk assembly, including:

a disk of generally circular shape, having a circumferential lip normal to the plane of said disk, said disk comprising a heat conducting material,

a split ring, fabricated from a material having a low coefficient of thermal expansion, said split ring having a diameter such that it fits within said circumferential lip of said disk and is in contact therewith,

a layer of brazing material interposed in between said split ring and said circumferential lip,

an expansion member, in the shape of a ring, having a diameter such that it fits snugly within said split ring when said split ring is mounted in said circumferential lip, said expansion member comprising a material having a high coefficient of thermal expansion, such that different rates of thermal expansion and contraction achieve both brazing and bonding of the assembly to the inside of said laser tube.



5,070,513

TRANSVERSE DISCHARGE EXCITED LASER HEAD WITH THREE ELECTRODES

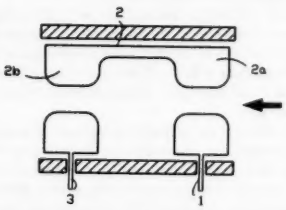
Tommaso Letardi, Rome, Italy, assignor to ENEA Comitato Nazionale per la Ricerca e per lo Sviluppo dell'Energia Nucleare e Delle Energie Alternative, Rome, Italy

Filed May 8, 1990, Ser. No. 520,552

Claims priority, application Italy, May 12, 1989, 47954 A/89

Int. Cl.[5] H01S *3/0971*

U.S. Cl. 372—83 **20 Claims**



1. Transverse discharge excited laser head, comprising a first electrode connected to ground, a second electrode spaced from said first electrode and connected to a condenser bank and a third electrode suitably spaced from said first and second electrodes, said third electrode facing the other two electrodes so as to form two distinct regions, one of which is the back current path of the other region so as to close the electrical circuit without using further conductors hindering the cross flow of the gas perpendicular to said discharges and to the length of the electrodes.

5,070,514

METHOD AND APPARATUS FOR CLEARING DATA PATH IN HALF DUPLEX MODEM RECEIVER WHILE MAINTAINING DYNAMIC PARAMETERS

Taruna Tjahjadi, Duluth, Ga., assignor to Hayes Microcomputer Products, Inc., Norcross, Ga.

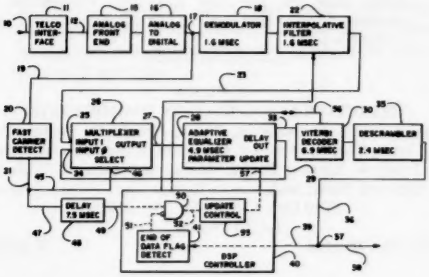
Filed Dec. 21, 1989, Ser. No. 454,180

Int. Cl.[5] H03H *7/30*

U.S. Cl. 375—14 **14 Claims**

1. In a modem receiver having an adaptive signal processing path of the type including a demodulator having a demodulator input and a demodulator output, an adaptive equalizer having an equalizer input, an equalizer output and a delay line

output, decoder means connected to said equalizer output for decoding digital data received by said modem receiver, a DSP controller for updating equalizer parameters of said adaptive equalizer during operation of said receiver, and a carrier detector for detecting a carrier signal loss condition at said demodulator input; the improvement comprising in combination:



a multiplexer interposed between said demodulator output and said equalizer input having a first input connected to said demodulator output, a second input connected to said delay line output and a multiplexer output connected to said equalizer input; and

selection means for causing said second input of said multiplexer to be connected to said multiplexer output in response to said carrier signal loss condition.

5,070,515

METHOD AND APPARATUS FOR PROCESSING DIGITAL SIGNAL

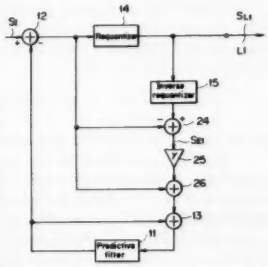
Naoto Iwahashi; Kenzo Akagiri, both of Kanagawa, and Hiromi Setoguchi, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 28, 1989, Ser. No. 317,290

Claims priority, application Japan, Feb. 29, 1988, 63-046595; Mar. 14, 1988, 63-061724

Int. Cl.[5] H04B *14/06*

U.S. Cl. 375—27 **7 Claims**



1. An apparatus for processing a quantized digital signal, comprising:

a predictive filter;

means connected to receive an input signal and to receive an output signal from said predictive filter for producing a difference signal responsive thereto;

requantizer means for requantizing said difference signal;

inverse requantizer means connected to said requantizer means for requantizing the output signal of said requantizer means to produce an inverse quantized signal with an inverse characteristic;

signal combining means for supplying a weighted signal to said predictive filter, said signal combing means including weighting means for receiving said inverse requantized signal and for producing a first weighted signal, and second means for receiving said difference signal and said first weighted signal for producing a second weighted signal, and means to provide said second weighted signal to said predictive filter;

said first and second weighted signals each being weighted by a predetermined amount relative to each other.

5,070,516

METHOD AND APPARATUS FOR REDUCING NOISE ON A SIGNAL ENCODABLE ON A PLURALITY OF PREDETERMINED LEVELS

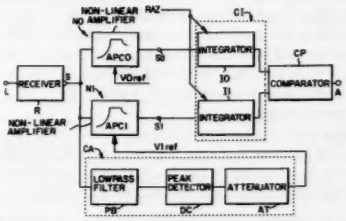
Michel L. Le Comte, Bures s/Yvette, France, assignor to JS Telecom, Louveciennes, France

Filed Mar. 21, 1990, Ser. No. 496,789

Claims priority, application France, Mar. 28, 1989, 89 04017

Int. Cl.[5] H04B *1/10*

U.S. Cl. 375—102 **12 Claims**



1. A method of filtering a received modulated digital signal having N logic levels with noise superposed thereon, N being not less than 2, wherein the instantaneous probability of existence of each logic level is converted into a corresponding one of N signals each having an amplitude which is at a maximum value when the value of the received signal is equal to the corresponding logic level and which is decreased by the application of a weighting coefficient as the value of the received signal moves away from the corresponding logic level, each of said N signals is integrated over the duration of an elementary modulation period of the received signal, and the logic level which corresponds to the largest value integral is recognized as the logic level of the received signal.

5,070,517

METHOD AND CIRCUIT FOR RETUNING THE FREQUENCY OF A FREQUENCY SOURCE

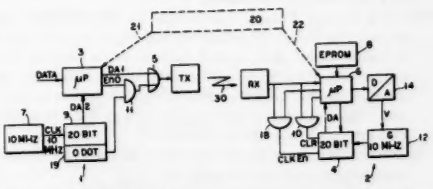
Helmut Köchler, and Günter Nestler, both of Samstagern, Switzerland, assignors to Erika Kochler, Samstagern, Switzerland

Filed Nov. 17, 1988, Ser. No. 272,721

Claims priority, application Switzerland, Nov. 23, 1987, 4552/87

Int. Cl.[5] H04L *25/38*

U.S. Cl. 375—117 **12 Claims**



1. A method for retuning the frequency of pulses of at least one oscillator at a substation to a reference frequency of pulses of a reference frequency oscillator at a reference station in a radio transmission network, in which the oscillator of the substation is coupled to a substation local counter and the

oscillator of the reference station is coupled to a reference station counter, the method comprising the steps of:

counting the pulses of the reference frequency oscillator in the reference station counter;

generating a start signal at the reference station when said reference station counter arrives at a predetermined first counting state known to both the reference station and the substation;

transmitting said start signal from the reference station to said substation immediately upon its generation;

receiving said start signal at said substation and starting said substation local counter at this moment;

generating a stop signal at said reference station when said reference station counter arrives at a predetermined second counting state known to both the reference and the substation;

transmitting a stop signal from the reference station to the substation;

receiving said stop signal at said substation and stopping said substation local counter immediately upon receipt thereof;

determining the total count of said substation local counter between said start and said stop signal and comparing this count with the total count of the reference station counter between said predetermined known first and second counting states;

deriving a frequency correction value from said comparison for the frequency source oscillator at said substation;

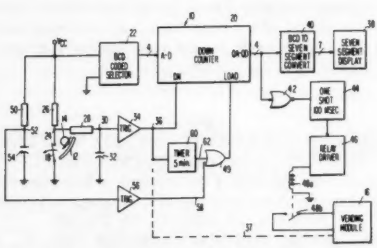
retuning the frequency of the frequency oscillator at said substation according to said correction value.

5,070,518

COIN COUNTING CONTROL APPARATUS FOR A VENDING MACHINE

Kurt Botker, Thurmont, Md., assignor to North American Philips Corp., New York, N.Y.

Filed Feb. 14, 1990, Ser. No. 480,692
Int. Cl.[5] G07F *5/00*; G06M *3/02*
U.S. Cl. 377—7 **9 Claims**



1. A coin counting apparatus for a vending machine comprising:

programmable means for forming a signal representation of a number of coins of a predetermined denomination necessary to initiate a vend cycle;

a down counter having a data input coupled to said programmable means for receiving said signal representation as initial count data at said data input, a control input controlling loading of said initial count data into said counter, a data output representing the current count of said counter, and a down count input for controlling decrementing said current count;

coin receiving means for the deposit of coins of said denomination to operate the vending machine;

coin responsive transducer means for detecting individual coins deposited in said coin receiving means, said coin responsive transducer means being coupled to said down count input for decrementing said current count by one in response to each coin detection until a zero count is reached to start said vending machine;

power up detection means for detecting power up of said coin counter; and

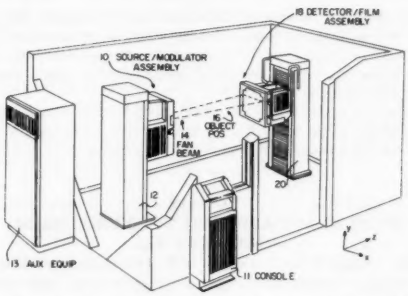
load control means including timer means connected to said control input and responsive to said power up detection means and to said coin responsive transducer means for causing reloading of said initial count data into said counter in response to either detecting of power up or the expiration of a predetermined time period set by said timer means after the last coin detection, irrespective of whether, prior to said loading, the current count of said counter is zero.

5,070,519

SELECTIVE EQUALIZATION RADIOGRAPHY

Jay A. Stein, Framingham, Mass.; Donald B. Plewes, Port Credit, Canada; Russell J. Gershman, Middleborough, Mass.; James G. Liebau, Boston, Mass., and John N. Williams, Concord, Mass., assignors to Hologic, Inc., Waltham, Mass.

Filed Oct. 4, 1990, Ser. No. 592,841
Int. Cl.[5] G21K *5/10*
U.S. Cl. 378—146 **20 Claims**



8. A selective equalization system for imaging an object having a selected field, comprising:

a source generating a beam of penetrating radiation scanning the object;

a modulator for locally modulating selected portions of the scanning beam; and

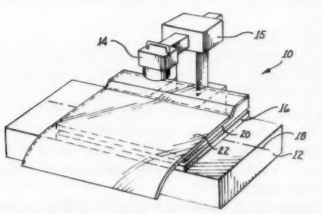
a control circuit controlling the modulator to cause the exposure which the beam delivers to the object to remain substantially constant over the selected field but to cause said exposure to vary elsewhere with selected local variations in the object.

5,070,520

X-RAY MACHINE ASSEMBLY INCLUDING TABLE COVER AND METHOD

Timothy E. Brown, 107 E. McKinley, Tempe, Ariz. 85281

Continuation-in-part of Ser. No. 539,562, May 18, 1990, Pat. No. 4,991,242. This application Jan. 16, 1991, Ser. No. 641,781
Int. Cl.[5] H05G *1/02*; A47G *9/00*
U.S. Cl. 378—196 **12 Claims**



1. A medical machine assembly comprising:

a base;

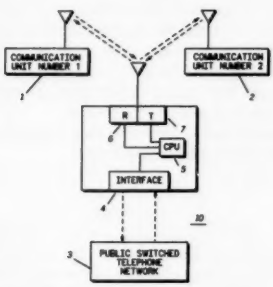
a patient table located on the base;

a cushion which is supported by the patient table;
a cover which is supported by the cushion;
said cushion having a rear dam portion and a body portion;
said cover having a rear dam portion which is located on the cushion rear dam portion;
said cover having a middle body portion disposed on the cushion body portion;
said cover having front flap portion means extending outwardly from the cover middle body portion over an edge of the patient table for protecting against fluids flowing around said cushion and said patient table into an interior portion of said base.

5,070,521
METHOD AND APPARATUS FOR CALL SOURCE IDENTIFICATION

Shawn A. Warner, Watauga, and Thomas R. Moder, N. Richland Hills, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 411,978, Sep. 25, 1989, abandoned. This application Jan. 11, 1991, Ser. No. 639,378
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—58 **9 Claims**

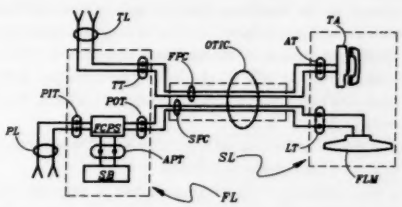


4. A communication system comprising:
a telephone network;
a radio communication unit; and
a central station comprising:
means for receiving a request to communicate with the radio communication unit:
means for determining whether the request orginated from another radio communication unit or from the telephone network;
means for transmitting a signal to the radio communication unit, the signal comprising a predetermined prefix or suffix identifying the telephone network party as the origin of the call, when the call is initiated by a party in the telephone network; and
means for transmitting only the communication unit identification code to identify the call as originating from another radio communication unit; and
the radio communication unit comprising:
means for receiving the signal transmitted by the central station; and
means for determining whether another radio communication unit or a telephone network party is calling, in response to the signal transmitted by the central station.

5,070,522
COMBINED SIGNAL AND POWER DISTRIBUTION SYSTEM

Ole K. Nilssen, Caesar Dr., Barrington, Ill. 60010

Continuation-in-part of Ser. No. 136,505, Dec. 23, 1987, Pat. No. 4,866,757, which is a continuation of Ser. No. 921,381, Oct. 22, 1986, abandoned. This application Aug. 23, 1989, Ser. No. 397,266
The portion of the term of this patent subsequent to Sep. 12, 2006, has been disclaimed.
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—90 **8 Claims**

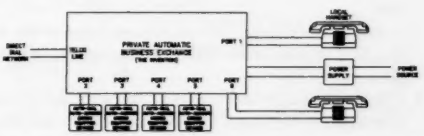


1. An arrangement comprising:
a) at a first location: i) telephone signal terminal means connected with an ordinary telephone utility signal line, and ii) electric power terminal means connected with a source of electric energy; the electric power terminal means including power limiting means operative, without requiring the breaking of electrical connection between the electric power terminal means and the source of electric energy, to manifestly prevent delivery from the electric power terminals means of electric power in excess of an amount sufficient to represent a fire initiation hazard;
b) at a second location: i) telephone signal utilization means having telephone signal utilization terminal means, and ii) electric power utilization means having electric power utilization terminal means; and
c) a signal and power transmission cable means having a telephone signal transmitting line and power transmitting conductors; the cable means being operative to provide telephone signal transmission and electric power transmission between the first location and the second location; the telephone signal transmitting line being connected with the telephone signal terminal means at the first location and with the telephone signal utilization terminal means at the second location; the conductors being connected with the electric power terminal means at the first location and with the electric power utilization terminal means at the second location.

5,070,523
PRIVATE AUTOMATIC BUSINESS EXCHANGE

George F. Hafer, and Lanham P. Rattan, both of Montrose, Colo., assignors to Da-Tel Research Co., Inc., Montrose, Colo.

Filed May 22, 1989, Ser. No. 355,413
Int. Cl.[5] H04M *11/00*
U.S. Cl. 379—94 **1 Claim**



1. In an interface exchange between one public switched telephone line and multiple telephone handsets and/or auto-dial/auto-answer modem-equipped devices, the combination comprised of:

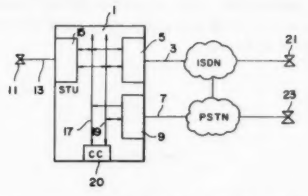
a. a ring detector that responds to the public switched telephone network ring signal of 40 to 150 V and 16 to 68 Hz;
b. a relay for going off-hook and signaling the public switched telephone network that the exchange is off-hook by completing the dc loop of the public switched telephone network;
c. a first transformer to electrically isolate the interface exchange from the public switched telephone network with respect to ground and dc loop currents of the public switched telephone network;
d. a second transformer to connect the signal from the exchange to the telephone handsets and/or auto-dial/auto-answer modem-equipped devices as may be connected to the output circuits of the exchange and provide for a dc loop current to any of the telephone handsets and/or auto-dial/auto-answer modem-equipped devices on demand;
e. a dual-tone multi-frequency tone detector for detection of dual-tone multi-frequency tones;
f. a microprocessor circuit programmed to respond to the output pulses of the dual-tone multi-frequency tone detector and drive the indicated relays to connect the public switched telephone network to the indicated port of multiple ports, and
to responds to the photo coupler outputs associated with the loop currents that appear at each port when a telephone handset or auto-dial/auto-answer modem-equipped device goes off-hook, and
to respond to establish priority between use of the exchange by received or locally originated calls, and
to respond to a call initiated at one of the ports, seal the line and operate relays to go off-hook and obtain a dial tone from the public switched telephone network for the calling telephone handset or auto-dial/auto-answer modem-equipped device to recognize before manual or automatic dialing begins, and
to provide a two second delay time after the ring detector response before activating a relay connecting the exchange audio to the public switched telephone network;
g. an optical coupler in the output circuit of each of multiple ports to sense the loop current drawn by that port's telephone handset or auto-dial/auto-answer modem-equipped device going off-hook and to signal the said microprocessor;
h. a dual-tone multi-frequency tone receiver; with circuitry programmed to drive selected relays to connect the public switched telephone network to one of multiple ports;
i. a circuit to generate a ring-back tone to indicate to the public switched telephone network that the indicated telephone handset or auto-dial/auto-answer modem-equipped device is being rung;
j. a ring generator under the control of the said microprocessor circuitry to ring the selected port and its telephone handset or auto-dial/auto-answer modem-equipped device;
k. a tone detector circuit that inhibits operation of the exchange if signals greater than −9 dBm are sensed at the ports;
l. a logic network to drive display lamps to indicate the active port even though the program priority has designated another port which can be connected to the public switched telephone line if the port's telephone handset or auto-dial/auto-answer modem-equipped device goes off-hook.

5,070,524

TELEPHONE SYSTEM

Hiroshi Mano, Hino, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 30, 1990, Ser. No. 605,411
Claims priority, application Japan, Oct. 30, 1989, 1-282163
Int. Cl.[5] H04M *1/60, 3/40*
U.S. Cl. 379—165 **6 Claims**



1. A telephone system connectable to both a digital communication network and an analog communication network, comprising:
(a) terminal means provided with functions of transmitting-/receiving speech signals;
(b) digital network interface means for providing an interface for communicating the speech signals in digital code form between the terminal means and the digital communication network;
(c) analog network interface means for providing an interface for communicating the speech signals in analog signal form between the terminal means and the analog communication network;
(d) speech level attenuating means for selecting a gain required to compensate for a difference in relative speech signal level between the digital communication network and the analog communication network, and for adding the selected gain to the speech signals communicated in digital code form between the terminal means and the digital communication network; and
(e) gain control means for controlling the gain selection by the speech level attenuating means.

5,070,525

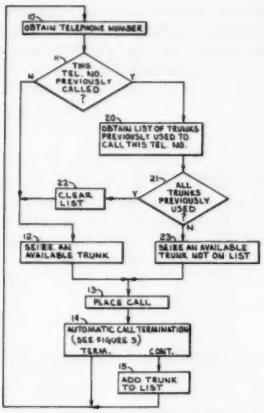
METHOD FOR AVOIDING CALL BLOCKING

Aleksander Szlam, Norcross; James W. Crooks, Jr., Marietta, and Charles L. Warner, II, Stone Mountain, all of Ga., assignors to Inventions, Inc., Norcross, Ga.

Filed Feb. 12, 1990, Ser. No. 478,619
Int. Cl.[5] H04M *15/10, 9/00*
U.S. Cl. 379—196 **62 Claims**

1. For use with an automated call dialing system, a method for avoiding a call blocking feature, comprising the steps of:
(a) obtaining a telephone number to be called;

(b) inspecting a list of trunks which have previously been used to call said telephone number;
(c) seizing a trunk which is not on said list; and


OBTAIN TELEPHONE NUMBER
THIS TEL. NO. PREVIOUSLY CALLED ?
OBTAIN LIST OF TRUNKS PREVIOUSLY USED TO CALL THIS TEL. NO.
CLEAR LIST
ALL TRUNKS PREVIOUSLY USED ?
SEIZE AN AVAILABLE TRUNK
SEIZE AN AVAILABLE TRUNK NOT ON LIST
PLACE CALL
AUTOMATIC CALL TERMINATION (SEE FIGURE 3)
TERM.
CONT.
ADD TRUNK TO LIST

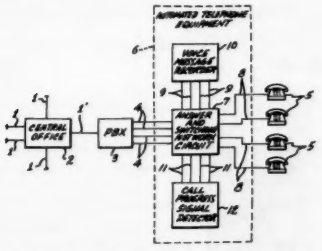
(d) placing a call by dialing said telephone number on said trunk.

5,070,526

SIGNAL ANALYZING SYSTEM

Robert L. Richmond, and Michael Robinson, both of Seattle, Wash., assignors to Active Voice, Inc., Seattle, Wash.

Filed Aug. 8, 1990, Ser. No. 564,805
Int. Cl.[5] H04M *1/64*
U.S. Cl. 379—372 **21 Claims**



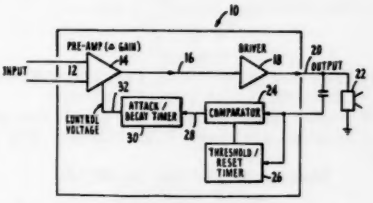
12. Mechanism for analyzing signals on a telephone line to detect the presence of call progress signals comprising means for converting the signal on the telephone line to digital samples representing the signal, and means for analyzing the digital samples so as to detect presence of a signal of uniform frequency content over a substantial period indicative of a call progress signal.

5,070,527

TIME DEPENDANT, VARIABLE AMPLITUDE THRESHOLD OUTPUT CIRCUIT FOR FREQUENCY VARIANT AND FREQUENCY INVARIENT SIGNAL DISCRIMINATION

Dwight D. Lynn, Santa Cruz, Calif., assignor to ACS Communications, Inc., Scotts Valley, Calif.

Continuation of Ser. No. 318,073, Mar. 2, 1989, Pat. No. 4,928,307. This application Mar. 12, 1990, Ser. No. 493,140
The portion of the term of this patent subsequent to May 22, 2007, has been disclaimed.
Int. Cl.[5] H04M *1/60*; H03G *3/20*
U.S. Cl. 379—395 **3 Claims**



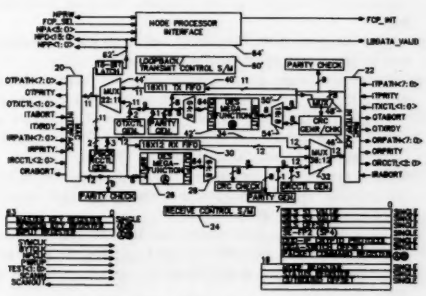
1. A signal compression system comprising:
(a) conditioning means responsive to a control signal for conditioning an input signal to provide a conditioned input signal;
(b) means for comparing the conditioned input signal and an initial threshold signal to provide a comparator output signal corresponding to the difference between the conditioned input signal and the initial threshold signal;
(c) means responsive to the comparator output signal for providing said control signal corresponding to the comparator output signal; and
(d) means responsive to the conditioned input signal for switching the initial threshold signal to a second threshold signal if the conditioned input signal exceeds the initial threshold signal for a preselected period of time.

5,070,528

GENERIC ENCRYPTION TECHNIQUE FOR COMMUNICATION NETWORKS

William R. Hawe, Pepperell; Joseph J. Tardo, Acton; Charles W. Kaufman; Amar Gupta, both of Northboro; Barry A. Spinney, Wayland, and Gregory M. Waters, Boston, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 29, 1990, Ser. No. 546,629
Int. Cl.[5] H04L *9/00*
U.S. Cl. 380—48 **16 Claims**



1. A method of handling information packets to be transmitted onto a communication network, and for which cryptographic processing is needed, the method comprising the steps of:

appending a cryptographic preamble to the beginning of an information packet for which cryptographic processing is needed;

passing the information packet to a cryptographic processor;

detecting, in the cryptographic processor, that cryptographic processing is needed;

analyzing the cryptographic preamble to determine the location in the packet of material to be cryptographically processed, and the type of cryptographic processing to be performed;

performing the requested cryptographic processing; and

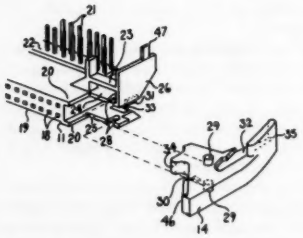
stripping the cryptographic preamble from the packet if the packet is to be transmitted onto the network, to preserve compatibility with existing packet formats transmitted over the network.

5,070,529

APPARATUS FOR SEQUENTIAL INTERCONNECTION OF ELECTRICAL CIRCUIT BOARDS

Richard Beaufort; James Sangroniz, and Darrell Cox, all of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 17, 1989, Ser. No. 339,435
Int. Cl.[5] H05K 7/14
U.S. Cl. 361—415 **8 Claims**



5. A pin interconnection assembly comprising:

a plurality of male electrical connector pins:

a generally rectangular male pin housing, having elongated sides and opposing ends, enclosing and supporting the pins in spaced relationship one to the other, said pin housing further having bearing surfaces adjacent the ends of said housing for;

a generally rectangular female receptacle housing having a plurality of female electrical receptacles for mating interfitting connection with the plurality of male electrical connector pins, and further having elongated sides and opposing ends with extension tabs for creating a space between the female receptacle housing and the interior ends of the male pin housing, said female receptacle housing sized for interfitting insertion into the male pin housing;

an upper support plate extending out from each opposing end of the rectangular female receptacle housing;

an intermediate support plate extending out from each opposing end of the rectangular female receptacle housing;

an end plate connecting the extended ends of each pair of upper and intermediate support plates to form a pair of opposing cantilevered upper support bridges;

a lower support plate extending out from each end of the rectangular female receptacle housing parallel to the upper support bridges;

said intermediate support plates and lower support plates each having a notch therein on the side edge of said plates adjacent the receptacle end of the female receptacle housing;

a pair of ejection levers, and

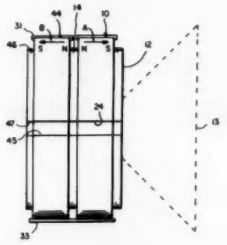
a pair of pivot pins, attached to opposing surfaces of each ejection lever and in coaxial alignment with each other, for pivotable engagement with said notches.

5,070,530

ELECTROACOUSTIC TRANSDUCERS WITH INCREASED MAGNETIC STABILITY FOR DISTORTION REDUCTION

Robert M. Grodinsky, 4448 W. Howard, Skokie, Ill. 60076, and David G. Cornwell, 3735 N. Ridgeway, Chicago, Ill. 60618

Continuation-in-part of Ser. No. 33,418, Apr. 1, 1987, abandoned. This application Mar. 25, 1988, Ser. No. 173,435
Int. Cl.[5] H04R 25/00
U.S. Cl. 381—201 **15 Claims**



1. An electroacoustic transducer comprising:

a magnetic structure including an electrically nonconductive ceramic permanent magnet defining a fixed magnetic field in an air gap;

an AC signal current carrying coil mounted for movement in said air gap, the signal current generating an AC magnetic field that undesirably interacts with said ceramic permanent magnet to produce distortion;

a top plate and a bottom plate sandwiching said ceramic permanent magnet and a substantially radial slot in said top plate, extending across the upper face of said ceramic permanent magnet; and

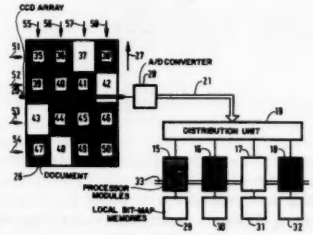
at least one substantially radial slot in the body of said ceramic permanent magnet producing a magnetic discontinuity in said ceramic permanent magnet and extending substantially parallel to the direction of magnetization of said ceramic permanent magnet, for stabilizing said fixed magnetic field and thereby reducing said distortion.

5,070,531

METHOD OF AND MEANS FOR PROCESSING IMAGE DATA

Cornelis P. Schuerman, Munich, Fed. Rep. of Germany, and Gadze C. Nauta, Venlo, Netherlands, assignors to Oce-Nederland B.V., Venlo, Netherlands

Filed Nov. 5, 1990, Ser. No. 609,415
Claims priority, application Netherlands, Nov. 6, 1989, 8902726
Int. Cl.[5] G06K 9/36
U.S. Cl. 382—49 **26 Claims**



13. A method of image processing using n processing modules comprising the steps of:

scanning the image linewise with a photoelectric scanner to generate scanned data

dividing said scanned data into data groups of kn columns and kn rows, where k is an integer greater than zero; and

transferring said scanned data of the data groups of a row to respective ones of the n processing modules, each row being transferred in a respective sequence which is offset along the row by one data group with respect to a sequence of an immediately preceding row, so that processing of said scanned data is distributed evenly over the n processing modules.

5,070,532

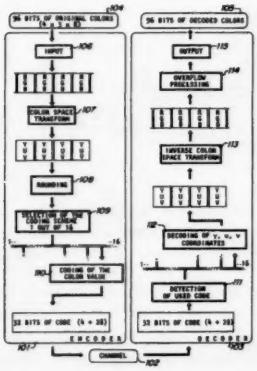
METHOD FOR ENCODING COLOR IMAGES

Jerome F. Faul, Sunnyvale, and Julien T. Nguyen, Redwood City, both of Calif., assignors to Radius Inc., San Jose, Calif.

Filed Sep. 26, 1990, Ser. No. 588,560

Int. Cl.[5] G06K *9/00*

U.S. Cl. 382—56 **5 Claims**



1. A method of encoding image information to be displayed by a conventional computer system, comprising the steps of:

grouping together adjacent portions of said information into a plurality of blocks, all such blocks being of an identical fixed size;

for each of said blocks, selecting one of a plurality of encoding schemes responsive to the portions of information comprising said block; and

encoding said block by writing a single encodes data word of fixed size that comprises a code identifying said selected encoding scheme and a plurality of data segments, each segment having a particular number of data bits responsive to said image information in said block, arranged in accordance with said selected encoding scheme.

5,070,533

ROBUST ELECTRICAL HEATING SYSTEMS FOR MINERAL WELLS

Jack E. Bridges, Park Ridge; Thomas J. Bajzek, Wood Dale; Kenneth E. Hofer, Chicago Ridge, all of Ill.; Homer L. Spencer, Calgary, Canada; Larry G. Smith, Calgary, Canada, and Vincent R. Young, Calgary, Canada, assignors to Uentech Corporation, Tulsa, Okla.

Filed Nov. 7, 1990, Ser. No. 610,080

Int. Cl.[5] E21B *7/15, 36/04;* **H05B** *3/02, 3/78*

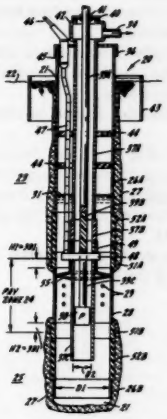
U.S. Cl. 392—301 **52 Claims**

1. An electrical heating system for a mineral well, such as an oil well, comprising:

a conductive metal casing of given diameter D1 disposed as a liner within a well bore that extends into the earth through a pay zone containing the desired mineral liquid, the casing comprising two sections separated by a gap within the pay zone;

a production tubing of given diameter D2, such that D2<D1, extending longitudinally through the casing in spaced relation thereto;

a multi-perforate heating electrode, comprising a cylinder having a diameter of about D1, positioned in the gap in the pay zone as a part of the casing, one end rim of the electrode being disposed inwardly of the pay zone by a distance of at least about 3D1 from the corresponding outer limit of the pay zone;



two non-conductive isolator cylinders, each having a diameter of about D1, each isolator cylinder mechanically connecting the electrode to the casing to afford a complete casing structure through the pay zone portion of the well bore;

and electrical power connection means for applying electrical power to the electrode.

5,070,534

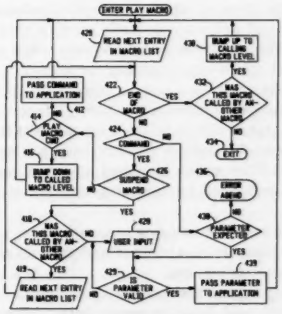
SIMPLIFIED CAD PARAMETRIC MACROINSTRUCTION CAPABILITY INCLUDING VARIATIONAL GEOMETRICS FEATURE

Martin C. Lascelles, Boulder, and Michael Wong, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 17, 1988, Ser. No. 258,965

Int. Cl.[5] G06F *15/00*

U.S. Cl. 395—155 **8 Claims**



1. A method in a system for creating graphics, said system

including means for displaying a work area having positions thereon identified by x,y coordinates, means for positioning a cursor within the work area, means for displaying commands within command areas in said work area wherein each command area is associated with a unique command, means for supplying a control signal, and processor means for executing commands, comprising the steps of:

maintaining, in response to a first command, a list of selected commands comprising the steps of

saving the x,y coordinates of the location of said cursor in response to the control signal,

determining whether the saved x,y coordinates are within a command area, and

storing sequentially in said list a code word uniquely identifying the command corresponding to a determined command area;

marking, in response to a second command, the end of the list;

executing, in response to a third command, the listed sequence of selected commands comprising the steps of

retrieving in sequence each entry from said list, and

passing each retrieved entry to the processor means for execution; and

terminating said executing steps when the retrieved entry marks the end of the list.

5,070,535

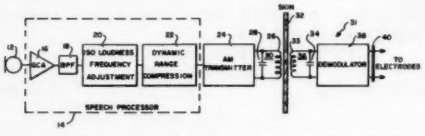
TRANSCUTANEOUS POWER AND SIGNAL TRANSMISSION SYSTEM AND METHODS FOR INCREASED SIGNAL TRANSMISSION EFFICIENCY

Ingeborg J. Hochmair, and Erwin S. Hochmair, both of A-1130 Wien Jaunerstrasse 27, Vienna, Austria

Continuation of Ser. No. 714,023, Mar. 20, 1985, abandoned. This application Jan. 30, 1987, Ser. No. 9,565

Int. Cl.[5] H04B *5/00*

U.S. Cl. 455—41 **4 Claims**



1. In a transcutaneous signal transmission system employing a transmitter coil and a magnetically coupled receiver coil, a method of effeciently transmitting signals while maintaining coil alignment tolerance comprising the steps of

providing external to a body a transmitter having a first tuned bandpass filter circuit including a first coupling coil, said first tuned circuit being tuned to a first frequency,

implanting in the body a receiver having a second tuned bandpass filter circuit including a second coupling coil, said second tuned circuit being tuned to a second frequency,

positioning said first coupling coil with respect to said second coupling coil in a position tolerance range to achieve optimum coupling, and

transmitting signals between said coupling coils at a third frequency, said third frequency being different from at least one of said first and second frequencies.

5,070,536

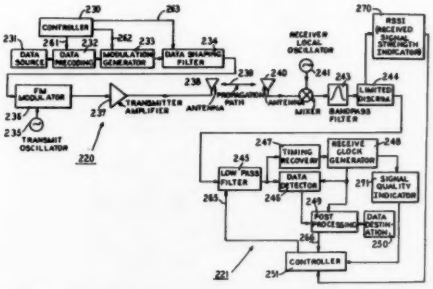
MOBILE RADIO DATA COMMUNICATION SYSTEM AND METHOD

Ronald L. Mahany; Marvin L. Sojka, and Guy J. West, all of Cedar Rapids, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa

Continuation-in-part of Ser. No. 228,355, Aug. 4, 1988, Pat. No. 4,910,794. This application Aug. 4, 1989, Ser. No. 389,727

Int. Cl.[5] H04B *17/00*

U.S. Cl. 455—67 **49 Claims**



1. The method of operating a radio frequency data communication system wherein a multiplicity of mobile transceiver units are to collect data and are to be able to transmit the collected data promptly after its collection to a base transceiver station, during movement of the mobile transceiver units at varying distances from the base transceiver station and wherein reliable communication with such mobile transceiver units over the area of movement of the mobile transceiver units could only take place at a limited normal data rate, said method comprising:

effecting transmission of a test signal from the base transceiver station to the mobile transceiver units,

at respective mobile transceiver units, evaluating characteristics of the test signal which are predictive of successful communication of the respective mobile transceiver unit with the base transceiver station at a higher than normal data rate in spite of potential adverse transmission conditions,

for less favorably situated mobile transceiver units which have collected data to send and which do not successfully receive the test signal or which do successfully receive the test signal but determine that the transmission at a high data rate would be likely to be subject to detrimental transmission conditions, arranging to send the collected data to the base transceiver station at a limited normal data rate, and

for more favorably situated mobile transceiver units which have collected data to send and which successfully receive the test signal and which determine that transmission conditions are not likely to prevent successful transmission at a high data rate, arranging to send the collected data at a high data rate substantially higher than the normal data rate.

5,070,537

SYSTEM FOR DETECTING DEFECTIVE POINT ON POWER TRANSMISSION LINE BY UTILIZING SATELLITE

Sakari Ohira; Masatoshi Yamaki, both of Sendai; Akira Terashima, Miraka, and Masaaki Ozawa, Hoya, all of Japan, assignors to Tohoku Electric Power Co., Inc., Sendai, Japan and Kyokuto Boeki Kaisha, Ltd., Tokyo, Japan

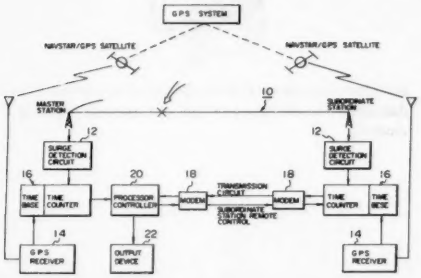
PCT No. PCT/JP89/00318, § 371 Date Nov. 24, 1989, § 102(e) Date Nov. 24, 1989, PCT Pub. No. WO89/09415, PCT Pub. Date Oct. 5, 1989

PCT Filed Mar. 24, 1989, Ser. No. 445,647

Claims priority, application Japan, Mar. 24, 1988, 63-70395

Int. Cl.[5] H04B *17/00;* G01R *31/08*

U.S. Cl. 455—67 4 Claims



1. A system for detecting a fault location on a power transmission line, said system comprising a master station, and a subordinate station electrically connected to said master station by a transmission circuit;

each of said master and subordinate stations comprising:

a surge detection circuit for detecting a surge voltage generated as a result of cutting of a power transmission line and producing a surge receiving signal indicative thereof;

a GPS receiver for receiving a transmission from a GPS satellite to generate predetermined periodic pulses, a reset signal, and GPS correction information based on said transmission;

a time counter/time base connected to said surge detection circuit and said GPS receiver for resetting a time period each time said reset signal is received from said GPS receiver, for converting said predetermined periodic pulses of said GPS receiver into a binary-coded digital signal representative of a time period since a reset, and for receiving said GPS correction information from said GPS receiver and responsively correcting said binary-coded digital signal to produce a corrected binary-coded digital signal said time counter/-time base including

means for latching said corrected binary-coded digital signal when said surge receiving signal is produced by said surge detection circuit, to generate a surge receiving time signal; and

communication means, connected to a corresponding communications means at the other station through said transmission circuit, said communications means in said subordinate station for transmitting said surge receiving time signal generated in said subordinate station therefrom to said master station; and

said master station further comprising a processor controller connected to said time counter/time base and said communication means for comparing said surge receiving time signal generated in said master station with said surge receiving time signal generated in said subordinate station and transmitted to said master station and for generating a signal representative of a distance to a fault point on said power transmission line based on said comparing.

5,070,538

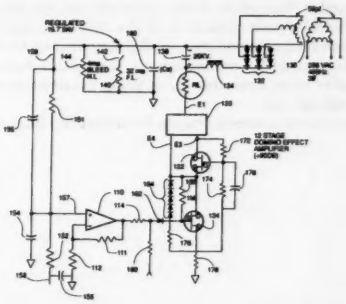
WIDE BAND DOMINO EFFECT HIGH VOLTAGE REGULATOR

Walter E. Milberger, Panama City, Fla.; Charles S. Kerfoot, Pasadena, and Franklin B. Jones, Catonsville, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 2, 1990, Ser. No. 459,870

Int. Cl.[5] H04B *1/04;* G05F *1/40;* H03F *3/04*

U.S. Cl. 455—126 10 Claims



1. A wide band high voltage regulator used with a high voltage power supply feeding a load, the high voltage power supply having first and second terminals for supplying direct current, with the load coupled between the first terminal and ground;

wherein said wide band high voltage regulator comprises a domino effect amplifier, a voltage divider, and an operational amplifier;

wherein said domino effect amplifier comprises N stages in tandem from a first stage to an Nth stage, each stage being a three-terminal unit having an input terminal, an output terminal and a common terminal, input means coupled between the input and common terminals of the first stage, the input means being coupled to an external signal source to provide an input signal to the first stage, the output terminal of the Nth stage being coupled via current-limiting means to the second terminal of said high-voltage power supply; each stage after the first having its input terminal coupled to the common terminal of the preceding stage, and its common terminal coupled to the output terminal of the preceding stage; each stage comprising an amplifying device having an inverting input, a non-inverting input and an output, a reference resistor connected between the input terminal of each stage and the non-inverting input of each amplifying device, a feedback resistor connected between the inverting input and the output of the amplifying device, the non-inverting input of each amplifying device being the common terminal of the stage, and the output of each amplifying device being the output terminal of each stage;

wherein said voltage divider is connected from the first terminal of the high voltage power supply to ground and has a tap near the ground end;

said operational amplifier has a non-inverting input, an inverting input, and an output, with its non-inverting input coupled to the tap of the voltage divider, its inverting input coupled to ground, and its output coupled to said input means of the domino effect amplifier.

5,070,539

WASHABLE MUG WITH SELF-CONTAINED SOUND SYSTEM

Peter S. C. Cheng, 5 Ross Street, Toronto, Ontario, Canada M5T 1Z8

Filed Jul. 17, 1989, Ser. No. 380,587

Int. Cl.[5] H04B *1/06;* **B65D** *25/28*

U.S. Cl. 455—344 **13 Claims**

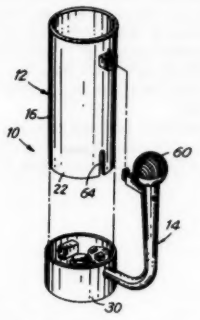
1. A washable, sound-emitting mug, comprising:

(a) a cup for containing a beverage, said cup having an annular side wall bounding a mouth;

(b) a discrete handle having a generally upright handle portion alongside the side wall;

(c) an electrical system supported by the handle, and operative for converting electrical energy into acoustical energy, including a battery-powered microphone mounted on the upright handle portion adjacent the cup mouth, said microphone being operative for detecting sounds uttered in the vicinity of the cup mouth and for generating electrical signals indicative of the detected sounds, said system further including a speaker mounted on the handle and electrically connected to the microphone, said speaker being operative for emitting the detected sounds therefrom; and

(d) detachable connector means for connecting the handle to the cup for holding the cup and the beverage therein during use, and for detaching the handle and the electrical system supported thereon from the cup to separately wash



and clean the cup away from the electrical system to avoid damaging the electrical system during such washing and cleaning.

DESIGN PATENTS

GRANTED DEC. 3, 1991

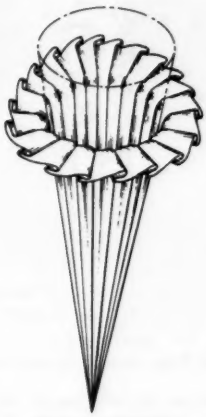
ERRATA

For CLASS	See PATENT NO.
D17-008	322,089
D24-145	322,143

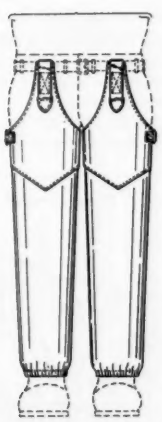
DESIGNS

DECEMBER 3, 1991

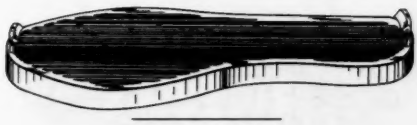
321,968
ICE CREAM CONE COVER
John Schindler, and Josephine Schindler, both of 3 Washington Sq., Larchmont, N.Y. 10538
Filed Jul. 18, 1990, Ser. No. 554,579
Term of patent 14 years
U.S. Cl. D1—116



321,969
PAIR OF CHAPS
William Upthegrove, Jr., and Joel A. Montgomery, Jr., both of St. Louis, Mo., assignors to Maverick Mountain, Inc., St. Louis, Mo.
Filed Sep. 19, 1989, Ser. No. 409,260
Term of patent 14 years
U.S. Cl. D2—225



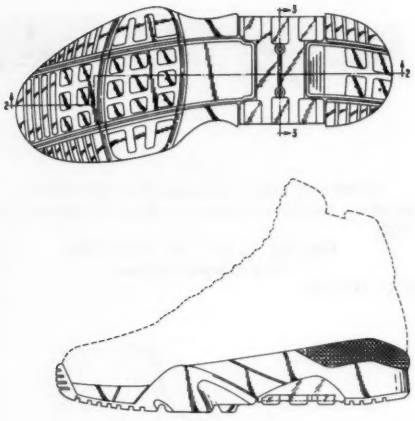
321,970
PROTECTIVE SOLE ATTACHMENT FOR SPIKED SHOES
Norman L. Cochran, 4664 Hardin-Marion Rd. N., Kenton, Ohio 43326
Filed Aug. 4, 1989, Ser. No. 389,556
Term of patent 14 years
U.S. Cl. D2—271



321,971
FOOT COVERING FOR BEACH AND POOL
Leonard C. Bajork, 144 Lakeview Ave., Montgomery, Tex. 77356
Filed Sep. 22, 1988, Ser. No. 247,575
Term of patent 14 years
U.S. Cl. D2—273

321,972
ANKLE GUARD
Stanley P. Konarowski, R.R. #6, Group 9, Box 54, Bowmanville, Ontario, Canada L1C 3K7
Filed Sep. 20, 1988, Ser. No. 246,307
Claims priority, application Canada, May 17, 1988, 17-05-88-4
Term of patent 14 years
U.S. Cl. D2—314

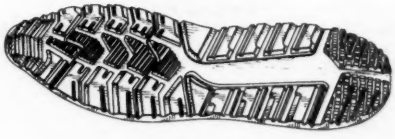
321,973
CUP SHAPED SHOE SOLE
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.
Filed Jul. 27, 1990, Ser. No. 558,419
Term of patent 14 years
U.S. Cl. D2—320



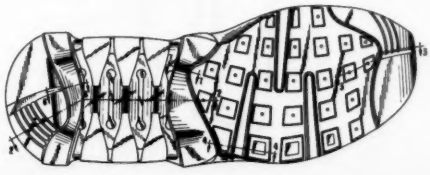
321,974
CUP SHAPED SHOE SOLE
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc. and Nike International, Ltd., both of Beaverton, Oreg.
Filed Jul. 27, 1990, Ser. No. 559,580
Term of patent 14 years
U.S. Cl. D2—320

321,975
SOLE SECTION OF A SPORT SHOE
Paul Arnulf, Alby sur Cheran, and Francois Girard, Cran Gevrier, both of France, assignors to Salomon S.A., Chavanod, France
Filed Oct. 23, 1989, Ser. No. 424,957
Claims priority, application Hague, Apr. 26, 1989, DM/013451
Term of patent 14 years
U.S. Cl. D2—320

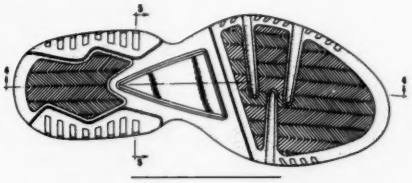
321,976
SHOE SOLE
Junichi Kiyosawa, Kobe, Japan, assignor to Asics Corporation, Hyogo, Japan
Filed Dec. 20, 1989, Ser. No. 452,468
Claims priority, application Japan, Jun. 20, 1989, 1-22656
Term of patent 14 years
U.S. Cl. D2—320



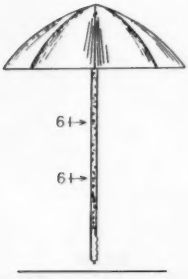
321,977
SHOE OUTSOLE BOTTOM
Bruce J. Kilgore, Lake Oswego, and Tinker Hatfield, Portland, both of Oreg., assignors to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.
Filed May 30, 1990, Ser. No. 530,974
Term of patent 14 years
U.S. Cl. D2—320



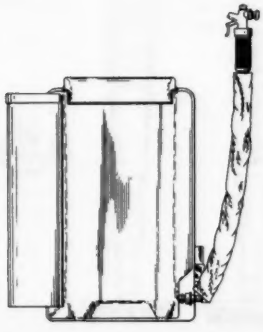
321,978
OUTSOLE OF A SHOE
Tinker L. Hatfield, Portland, Oreg., assignor to Nike, Inc. and Nike International Ltd., both of Beaverton, Oreg.
Filed Nov. 27, 1990, Ser. No. 618,819
Term of patent 14 years
U.S. Cl. D2—320



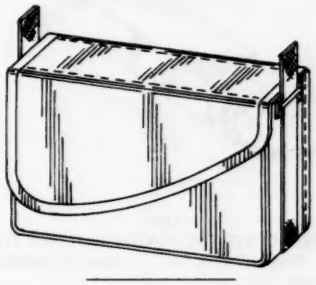
321,979
ILLUMINATED UMBRELLA
Albert DeSantis, 1955 NW. 55th Ave., Margate, Fla. 33063, and Arthur Meyers, 151 E. Palmetto Park Rd., Boca Raton, Fla. 33432
Filed Jan. 27, 1987, Ser. No. 7,411
Term of patent 14 years
U.S. Cl. D3—5



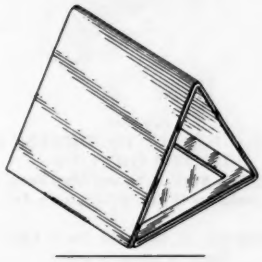
321,980
PORTABLE BEVERAGE DISPENSER
Robert L. Billet, Lower Gwynedd, Pa., assignor to Thirst Aid, Inc., Lower Gwynedd, Pa.
Filed Jul. 18, 1988, Ser. No. 220,847
Term of patent 14 years
U.S. Cl. D3—32



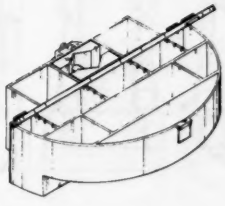
321,981
CAMERA CASE OR THE LIKE
Rudolph M. Hanke, Monheim, Fed. Rep. of Germany, assignor to Hamaphot KG Hanke & Thomas, Monheim/Bayern, Fed. Rep. of Germany
Filed Feb. 12, 1990, Ser. No. 478,999
Claims priority, application World Int. Prop. O., Dec. 20, 1989, DM 015 398
Term of patent 14 years
U.S. Cl. D3—33



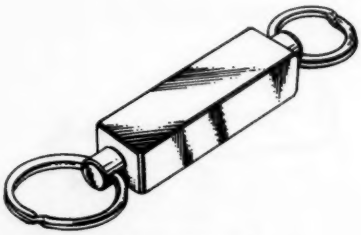
321,982
COMPACT DISC CASE
Nae Yasuhara, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Dec. 7, 1989, Ser. No. 447,243
Claims priority, application Japan, Jun. 9, 1989, 1-21482
Term of patent 14 years
U.S. Cl. D3—35



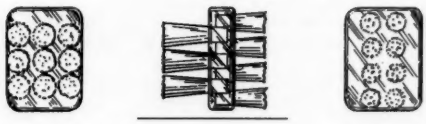
321,983
FISHING TACKLE BOX
Gary W. Tackett, and John F. Chappelle, both of Little Rock, Ark., assignors to Rufcut, Inc., Little Rock, Ark.
Filed May 1, 1989, Ser. No. 346,012
Term of patent 14 years
U.S. Cl. D3—38

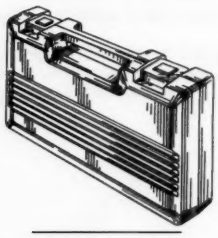


321,984
KEY HOLDER
Woodrow C. Stillwagon, 7610 Ball Mill Rd., Atlanta, Ga. 30338
Filed Aug. 1, 1986, Ser. No. 891,489
Term of patent 14 years
U.S. Cl. D3—61

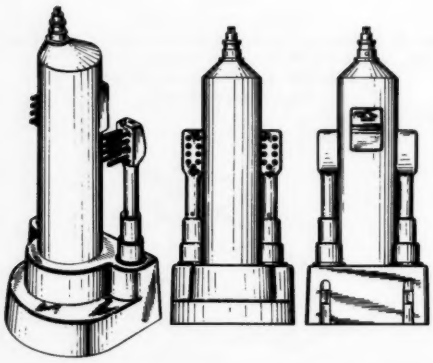


321,985
CASE FOR CORDLESS POWER RATCHET TOOL
William W. Ward, Clayton, N.C., assignor to Southern Case, Inc., Raleigh, N.C.
Filed Jun. 30, 1989, Ser. No. 373,484
Term of patent 14 years
U.S. Cl. D3—73



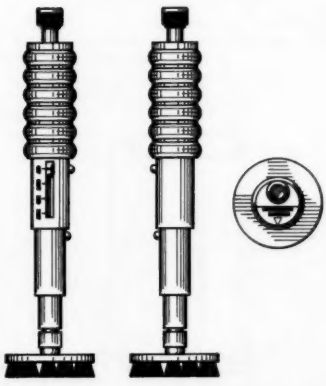


321,986
COMBINED AUTOMATIC TOOTHBRUSH SET AND HOLDER THEREFOR
Jeffrey Snyder, New York, N.Y., and May Fung, Hong Kong, Hong Kong, assignors to Etna Products Co. Inc., New York, N.Y.
Filed Aug. 23, 1990, Ser. No. 571,883
Term of patent 14 years
U.S. Cl. D4—101

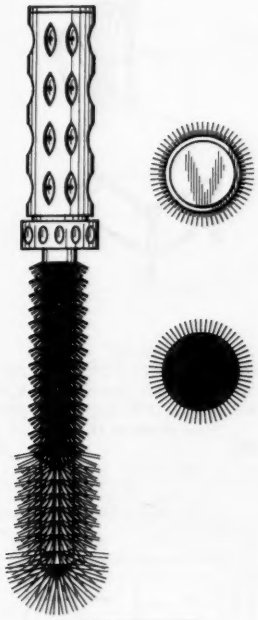


321,987
HANDLELESS TOOTHBRUSH
Dennis G. Oates, 4251 Ingraham St., San Diego, Calif. 92109
Filed Feb. 27, 1989, Ser. No. 316,166
Term of patent 14 years
U.S. Cl. D4—106

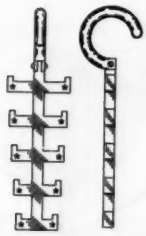
321,988
POWER CLEANING BRUSH
Morgan E. A. Fedora, P.O. Box 7787, South Lake Tahoe, Calif. 95731
Filed Jul. 10, 1989, Ser. No. 377,403
Term of patent 14 years
U.S. Cl. D4—102



321,989
AUTOMATIC POT SCRUBBER
Joyce A. Wilson, 3820 Firdrona Dr. NW., Gig Harbor, Wash. 98335
Filed Feb. 19, 1988, Ser. No. 157,519
Term of patent 14 years
U.S. Cl. D4—128

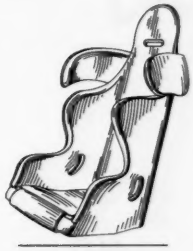


321,990
HOLDER FOR MULTIPLE GARMENT HANGERS
Fidel Hernandez, 205 E. Belmont Ave., Kalamazoo, Mich. 49001
Filed Feb. 21, 1990, Ser. No. 482,724
Term of patent 14 years
U.S. Cl. D6—316

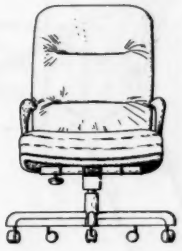


321,991
COMBINED CUTTING BOARD AND SEAT
William H. Menges, Sr.; William H. Menges, Jr., both of Pt. Pleasant, and Douglas Finlay, Brick Town, all of N.J., assignors to Fast Feat Bucket Board Co., Brielle, N.J.
Filed Jun. 27, 1988, Ser. No. 211,848
Term of patent 14 years
U.S. Cl. D6—335

321,992
VEHICLE SEAT OR SIMILAR ARTICLE
Brian T. Butler, Concord, N.C., assignor to Butler Specialties, Inc., Harrisburg, N.C.
Filed Dec. 9, 1988, Ser. No. 282,292
Term of patent 14 years
U.S. Cl. D6—356



321,993
CHAIR
David P. Zagaroli, 2035 Eleventh St., and Ward E. Taylor, Box 1874, Rte. 5, both of, Hickory, N.C. 28601
Filed Jul. 22, 1988, Ser. No. 222,737
Term of patent 14 years
U.S. Cl. D6—366

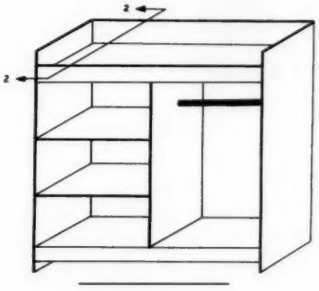


321,994
CHAIR
Robert M. Scheper, Grand Rapids, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.
Continuation-in-part of Ser. No. 150,100, Jan. 29, 1988, abandoned. This application Sep. 29, 1988, Ser. No. 251,588
Term of patent 14 years
U.S. Cl. D6—373

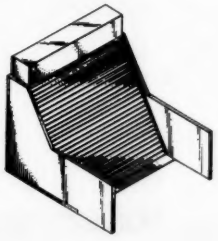
321,995
CHAIR FRAME
Herbert C. Saiger, Troy, Ohio, assignor to Crown Leisure Products, Inc., Owosso, Mich.
Filed Sep. 9, 1988, Ser. No. 243,644
Term of patent 14 years
U.S. Cl. D6—379

321,996
CHAIR
Yann H. Chen, No. 23, Lane 75, Shin Yih Road, Tzu Kuan Village, Kaohsiung Hsien, Taiwan
Filed Nov. 15, 1988, Ser. No. 271,481
Term of patent 14 years
U.S. Cl. D6—380

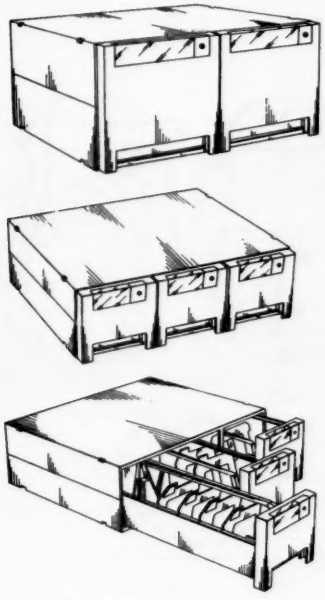
321,997
DOLL'S CHANGING TABLE OR SIMILAR ARTICLE
Janet E. Inman, P.O. Box 352, Woodland Park, Colo. 80866
Filed Oct. 12, 1988, Ser. No. 257,034
Term of patent 14 years
U.S. Cl. D6—397



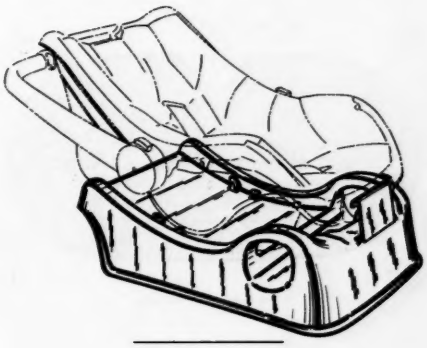
321,998
SECURITY WORKSTATION ENCLOSURE
James E. Georgopoulos, 83 Hanover St., Manchester, N.H. 03101
Filed May 11, 1989, Ser. No. 350,832
Term of patent 14 years
U.S. Cl. D6—433



321,999
DISK STORAGE CASE
Makio Hasuike, Milan, Italy, assignor to Seima Italiana SpA, Tolmezzo, Italy
Filed Jan. 15, 1988, Ser. No. 144,856
Claims priority, application Italy, Jul. 21, 1987, 60408/87[U]
Term of patent 14 years
U.S. Cl. D6—446

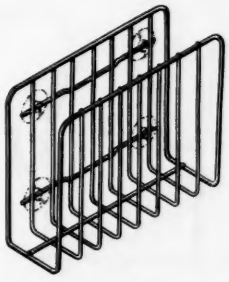


322,001
DETACHABLE BASE FOR A BABY'S ROCKER
Paul K. Meeker, Aurora, Ohio, assignor to Spalding & Evenflo Companies, Inc., Tampa, Fla.
Filed Oct. 31, 1988, Ser. No. 265,435
Term of patent 14 years
U.S. Cl. D6—495

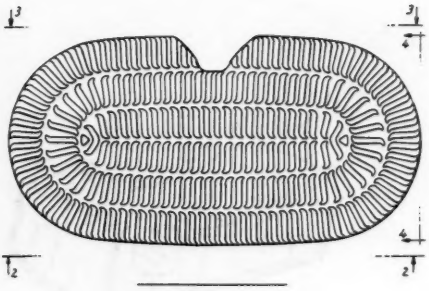


322,000
SIDE TABLE
James Rosen, Los Angeles, Calif., assignor to The Pace Collection, Inc., Long Island City, N.Y.
Filed Feb. 28, 1989, Ser. No. 316,674
Term of patent 14 years
U.S. Cl. D6—487

322,002
MULTIPURPOSE WALL-MOUNTABLE CADDY
William W. Emery, Berkeley Heights, N.J., assignor to Better Sleep Manufacturing Co., Berkeley Heights, N.J.
Filed Nov. 6, 1989, Ser. No. 431,976
Term of patent 14 years
U.S. Cl. D6—566

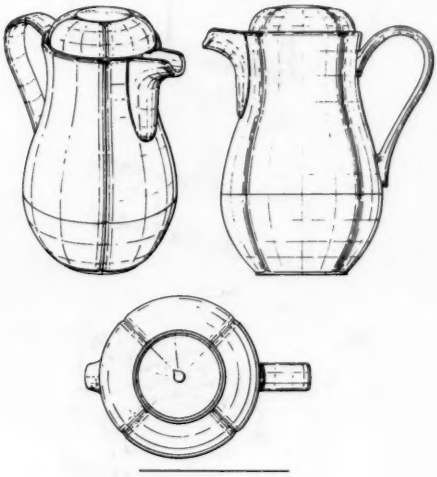


322,003
NON-SLIP SURFACE UNIT FOR BATHTUBS OR THE LIKE
Renee M. Hytry, Kohler, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Jan. 17, 1989, Ser. No. 297,795
Term of patent 14 years
U.S. Cl. D6—583

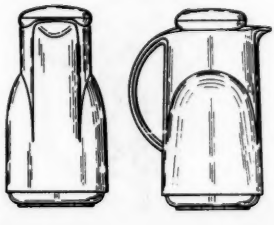


322,004
STRAW
Curt E. Whitright, 11257 Thwing Rd., Chardon, Ohio 44024
Filed May 1, 1989, Ser. No. 345,646
Term of patent 14 years
U.S. Cl. D7—300.2

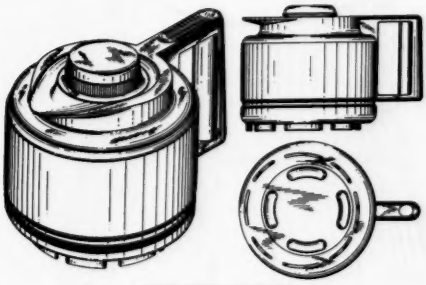
322,005
BEVERAGE POT
Sun K. Cliff, Kowloon, Hong Kong, assignor to Kin Hip Metal & Plastic Factory Limited, Kwun Tong, Hong Kong
Filed May 1, 1989, Ser. No. 347,231
Claims priority, application United Kingdom, Feb. 15, 1989, D1057171
Term of patent 14 years
U.S. Cl. D7—317



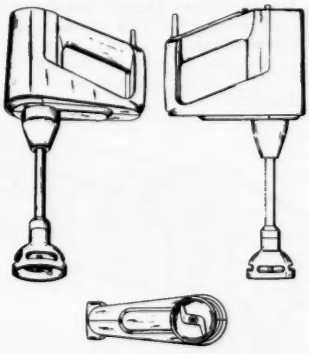
322,006
INSULATED JUG
Anso Zimmermann, Niederaula, Fed. Rep. of Germany, assignor to Rotpunkt Dr. Anso Zimmermann, Niederaula, Fed. Rep. of Germany
Filed Sep. 23, 1988, Ser. No. 248,475
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1988, 8AR 50/88
Term of patent 14 years
U.S. Cl. D7—317



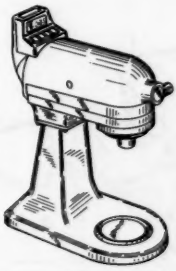
322,007
THERMAL CARAFE
Duane D. Adams, Deep River, and Ronald L. Muller, Old Saybrook, both of Conn., assignors to North American Philips Corporation, New York, N.Y.
Filed Aug. 22, 1989, Ser. No. 397,054
Term of patent 14 years
U.S. Cl. D7—317



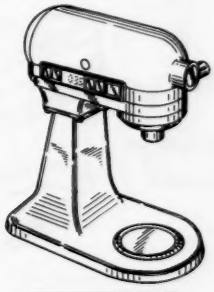
322,008
HAND-HELD CHOPPER
Ludwig Littmann, Königstein, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany
Filed Oct. 26, 1988, Ser. No. 263,029
Claims priority, application Fed. Rep. of Germany, May 4, 1988, 73MR9680
The portion of the term of this patent subsequent to Nov. 26, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—376



322,009
FOOD MIXER
Lawrence A. Doggett, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Nov. 7, 1988, Ser. No. 267,776
Term of patent 14 years
U.S. Cl. D7—379

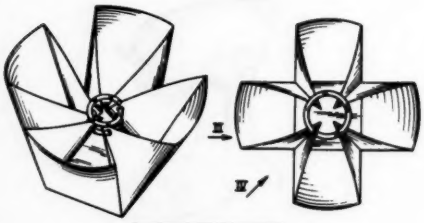


322,010
FOOD MIXER
Lawrence A. Doggett, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.
Filed Nov. 7, 1988, Ser. No. 267,787
Term of patent 14 years
U.S. Cl. D7—379

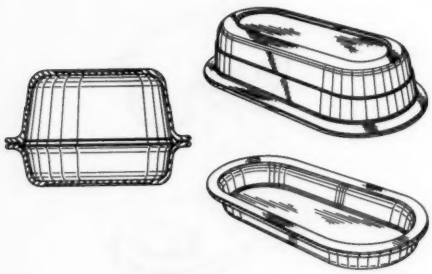


322,011
LAZY SUSAN TRAY
Jerome L. Asner, 501 SW. 9, Oklahoma City, Okla. 73109
Filed Feb. 21, 1989, Ser. No. 312,783
Term of patent 14 years
U.S. Cl. D7—501

322,012
COLLAPSIBLE CUP FOR BEVERAGE, FOOD, OR SIMILAR ARTICLE
Philippe Mercier, Paris, France, assignor to Gold Star Co., Ltd., Yoido, Rep. of Korea
Filed Dec. 14, 1988, Ser. No. 284,476
Term of patent 14 years
U.S. Cl. D7—512



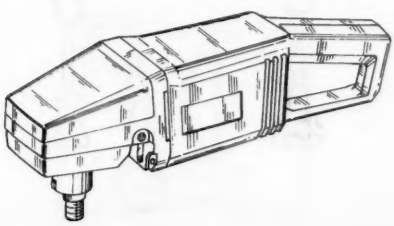
322,013
COVERED SERVING DISH OR THE LIKE
Robert H. C. M. Daenen, Erembodegem, and Pieter K. J. De-Coster, Aalst, both of Belgium, assignors to Dart Industries Inc., Deerfield, Ill.
Filed Mar. 17, 1989, Ser. No. 327,172
Term of patent 14 years
U.S. Cl. D7—542



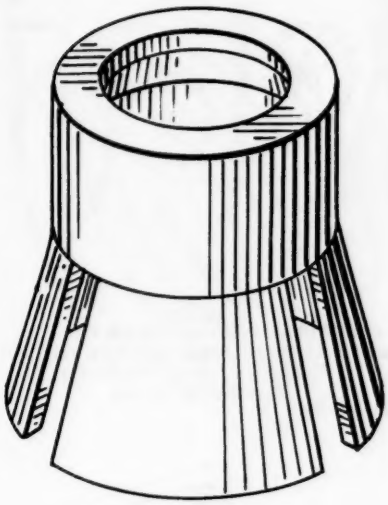
322,014
LEAF CARRIER
James M. Weihe, 709 Victoria Park Rd., Ft. Lauderdale, Fla. 33304
Filed Nov. 21, 1989, Ser. No. 439,562
Term of patent 14 years
U.S. Cl. D8—1

322,015
TOOL FOR PLACING A CAPACITOR INTO AN ELECTRONIC CIRCUIT
Donald J. Davis, Jr., Rocky Point, N.Y., assignor to American Technical Ceramics Corporation, Huntington Station, N.Y.
Filed Nov. 21, 1988, Ser. No. 274,046
Term of patent 14 years
U.S. Cl. D8—14

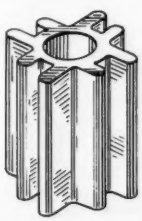
322,016
RIGHT ANGLE SANDER/GRINDER
James E. Thurler, Pickens, S.C.; Philip J. Snoke, Atlanta, and Devin L. Moore, Decatur, both of Ga., assignors to Ryobi Motor Products Corp., Pickens, S.C.
Filed Mar. 23, 1989, Ser. No. 327,580
Term of patent 14 years
U.S. Cl. D8—62



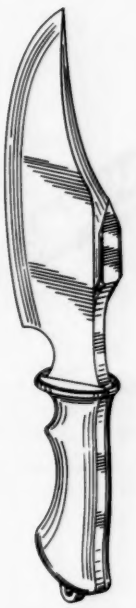
322,017
THREAD PROTECTING AND GUIDING CAP
Don T. Van Allman, Palatine, and Harish C. Gupta, Downers Grove, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.
Filed May 30, 1989, Ser. No. 358,042
Term of patent 14 years
U.S. Cl. D8—70



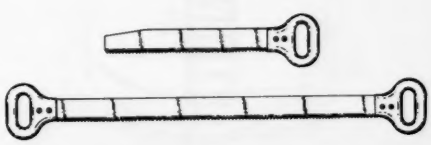
322,018
GUIDANCE DEVICE
Don T. Van Allman, Palatine, and Harish C. Gupta, Downers Grove, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.
Filed May 30, 1989, Ser. No. 358,041
Term of patent 14 years
U.S. Cl. D8—70



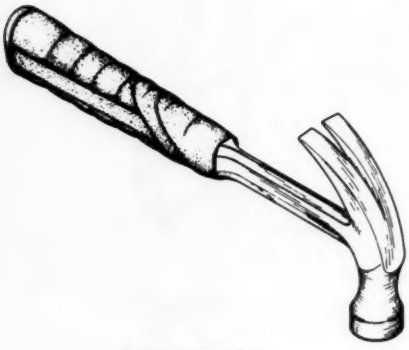
322,019
HAND AXE
Edward L. Cox, 2737 Gross Pointe Rd., Evanston, Ill. 60201
Continuation-in-part of Ser. No. 862,366, May 9, 1986. This application Jun. 3, 1988, Ser. No. 204,916
Term of patent 14 years
U.S. Cl. D8—76



322,020
HANDSAW
Ronald A. Grachan, 1400 Valley Wind La., Missoula, Mont. 59802
Continuation of Ser. No. 352,036, May 15, 1989, abandoned, which is a continuation-in-part of Ser. No. 304,875, Jan. 31, 1989, Pat. No. 4,856,193, which is a continuation-in-part of Ser. No. 77,179, Jul. 24, 1987, abandoned. This application Jan. 24, 1990, Ser. No. 469,706
Term of patent 14 years
U.S. Cl. D8—95

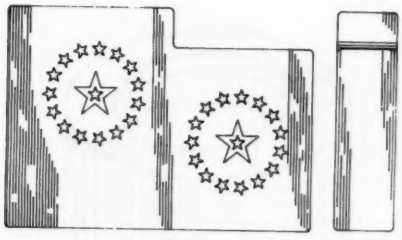


322,021
HAMMER
Cheng T. Hsu, 5 Fl. No. 11-2, Chung Hsiau E. Rd., Sec. 1, Taipei, Taiwan
Filed Mar. 20, 1989, Ser. No. 325,512
Term of patent 14 years
U.S. Cl. D8—75

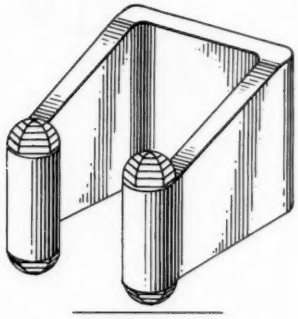


322,022
PAIR OF RAKE HANDLE HAND GRIPS
June Cunningham, and Dale M. Cunningham, both of 19712 Maxine, St. Clair Shores, Mich. 48080
Filed Jul. 17, 1989, Ser. No. 380,261
Term of patent 14 years
U.S. Cl. D8—303

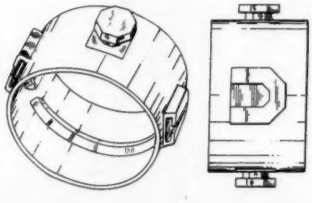
322,023
GASOLINE PUMP NOZZLE TRIGGER HOLDER
Edward R. Livingston, 32743 Stricker Dr., Warren, Mich. 48093
Filed May 4, 1990, Ser. No. 518,862
Term of patent 14 years
U.S. Cl. D8—354



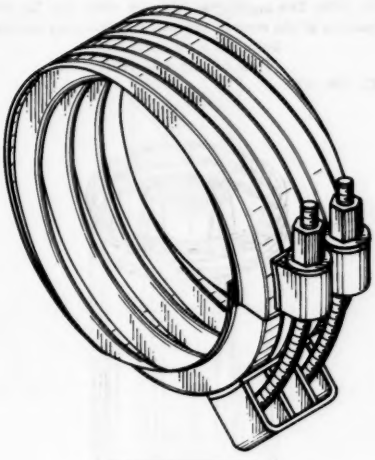
322,024
CLIP FOR A CASSETTE CASE OR THE LIKE
William Archer, 3303 Mt. Bonnell Dr., Austin, Tex. 78731
Filed Feb. 17, 1989, Ser. No. 311,892
Term of patent 14 years
U.S. Cl. D8—395



322,025
INTERLOCKING TWO CAN CONNECTOR FOR FURNITURE, TOYS OR THE LIKE
Lance W. Funston, 2044 Spruce St., Philadelphia, Pa. 19103, assignor to Lance W. Funston, Philadelphia, Pa.
Filed Mar. 23, 1989, Ser. No. 327,576
Term of patent 14 years
U.S. Cl. D8—382

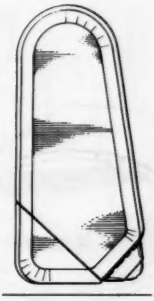


322,026
TUBE CLAMP
Shiro Kanao, 4-9-18, Nanpeidai, Takatsuki-Shi, Osaka, Japan
Filed Apr. 26, 1990, Ser. No. 514,009
Claims priority, application Japan, Oct. 30, 1989, 1-39580
Term of patent 14 years
U.S. Cl. D8—396



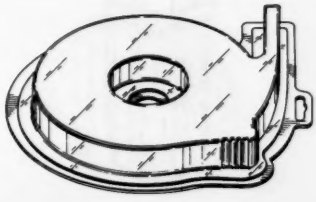
322,027
COMBINED BOTTLE AND CAP
Lis Knudsen, Dr. Tvaergade 38, DK-1302 Copenhagen, and Poul K. Andersen, Kastrupvej 334, DK-2770 Kastrup, both of Denmark
Filed Dec. 20, 1988, Ser. No. 287,984
Claims priority, application Denmark, Jun. 28, 1988, 0776/1988
Term of patent 14 years
U.S. Cl. D9—367

322,028
DISPENSER
Paul Appleby, 557 Melita Crescent, Toronto, Ontario, Canada M6G 3Y7 , and Jerry N. Moscovitch, 59 Cowan Avenue, Toronto, Ontario, Canada M6K 2N1
Filed Aug. 30, 1989, Ser. No. 401,339
Term of patent 14 years
U.S. Cl. D9—370

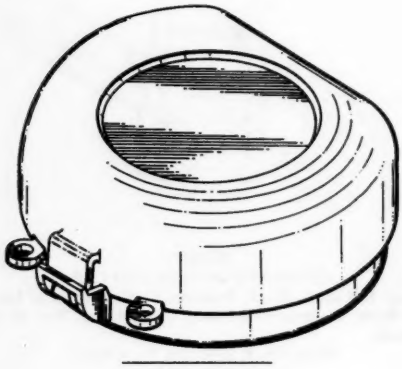


322,029
COMBINED BOTTLE AND CAP
Mauro D. Caputo, Pacific Palisades, Calif., assignor to Eau de Cologne- & Perfumerie-Fabrik, Cologne, Fed. Rep. of Germany
Filed Feb. 8, 1990, Ser. No. 478,162
Term of patent 14 years
U.S. Cl. D9—403

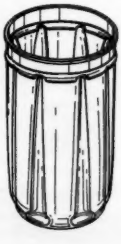
322,030
COMBINED TAPE DISPENSER AND DISPLAY PACKAGE
Vincent A. Chumenti, 20 Soulice Pl., New Rochelle, N.Y. 10802
Filed Dec. 22, 1988, Ser. No. 288,699
Term of patent 14 years
U.S. Cl. D9—415



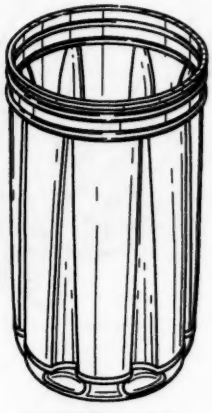
322,031
CARRYING CASE
Jim Fleming, 290 Nashville Rd., Kleinburg, Ontario, Canada L0J 1C0
Filed Nov. 29, 1989, Ser. No. 442,933
Term of patent 14 years
U.S. Cl. D9—424



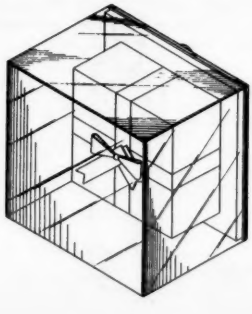
322,032
STACKABLE CONTAINER
Stephen P. Palisin, Jr., South Euclid, Ohio, assignor to Berwick Manufacturing, Inc., Cleveland, Ohio
Continuation-in-part of Ser. No. 299,957, Jan. 23, 1989, which is a continuation-in-part of Ser. No. 270,123, Nov. 14, 1988. This application Jun. 23, 1989, Ser. No. 372,300
The portion of the term of this patent subsequent to Oct. 15, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—429



322,033
STACKABLE CONTAINER
Stephen P. Palisin, Jr., South Euclid, and Raymond J. Keller, Macedonia, both of Ohio, assignors to Berwick Manufacturing, Inc., Cleveland, Ohio
Continuation-in-part of Ser. No. 271,157, Nov. 14, 1988, Pat. No. 4,909,373, and a continuation-in-part of Ser. No. 270,123, Nov. 14, 1988, and a continuation-in-part of Ser. No. 270,122, Nov. 14, 1988, and a continuation-in-part of Ser. No. 299,957, Jan. 23, 1989, and a continuation-in-part of Ser. No. 372,300, Jun. 23, 1988. This application Mar. 19, 1990, Ser. No. 495,856
The portion of the term of this patent subsequent to Oct. 15, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—429



322,034
CLOCK
Hajime Kumazawa, Ichinomiya, Japan, assignor to Iwashima Electronics Co., Ltd., Nagoya, Japan
Filed Jun. 14, 1989, Ser. No. 366,033
Claims priority, application Japan, Dec. 15, 1988, 63-48935
Term of patent 14 years
U.S. Cl. D10—6

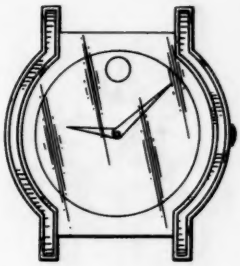


322,035
CLOCK
Hisako Sugano, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Aug. 29, 1989, Ser. No. 400,042
Term of patent 14 years
U.S. Cl. D10—23

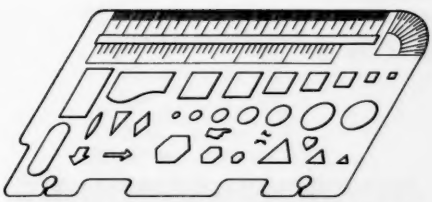
322,036
CLOCK
Mitsuo Wada, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan
Filed Sep. 11, 1989, Ser. No. 405,676
Term of patent 14 years
U.S. Cl. D10—27

322,037
WRIST WATCH
Naomi Takani, Tachikawa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan
Filed Jun. 28, 1989, Ser. No. 372,936
Term of patent 14 years
U.S. Cl. D10—32

322,038
WRIST WATCH
Florian Strasser, Meinisberg, and Hugo Berger, LeLocle, both of Switzerland, assignors to North American Watch Corporation, New York, N.Y.
Filed Jun. 30, 1988, Ser. No. 213,988
Term of patent 14 years
U.S. Cl. D10—39

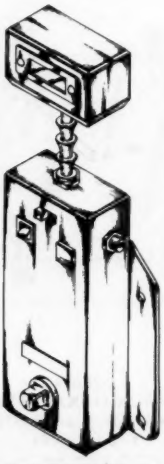


322,039
MULTI-FUNCTIONAL TEMPLATE
Jui Chen Chien, Taipei, Taiwan, assignor to Pelle International Merchandisers, Inc., Taipei, Taiwan
Filed Nov. 13, 1989, Ser. No. 434,769
Term of patent 14 years
U.S. Cl. D10—64



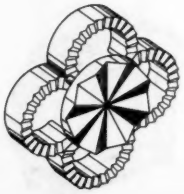
322,040
MEASURING TAPE
Robert J. Dewire, Naperville, and Walter A. Kozlowski, Schaumburg, both of Ill., assignors to Sears, Roebuck & Co., Chicago, Ill.
Filed Jun. 30, 1989, Ser. No. 374,547
Term of patent 14 years
U.S. Cl. D10—72

322,041
TORQUE WRENCH TESTER
Bradley G. Jenkins, Sunland, Calif., assignor to Consolidated Devices Inc., Industry, Calif.
Filed Sep. 25, 1989, Ser. No. 414,422
Term of patent 14 years
U.S. Cl. D10—83



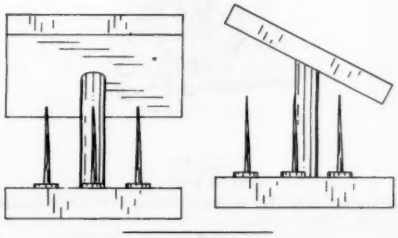
322,042
EXPANSION BRACELET
Murray L. Cowan, Norwood, Mass., assignor to Textron Inc., Providence, R.I.
Filed Oct. 26, 1989, Ser. No. 426,728
Term of patent 14 years
U.S. Cl. D11—25

322,043
JEWELRY LINK
Meang Chia, and Cheo Chia, both of Chain & Charm Manufacturers, 412 W. 6th St., Suite #1104, Los Angeles, Calif. 90014
Filed Dec. 15, 1989, Ser. No. 451,039
Term of patent 14 years
U.S. Cl. D11—93

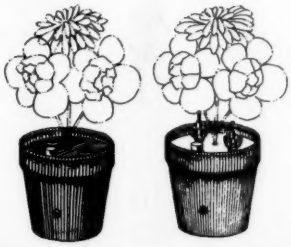


322,044
TABLETOP NOVELTY
Francis C. Marsar, Jr., and Amalia Marsar, both of 901 Woodrow Rd., Staten Island, N.Y. 10312
Filed Jul. 21, 1989, Ser. No. 383,884
Term of patent 14 years
U.S. Cl. D11—117

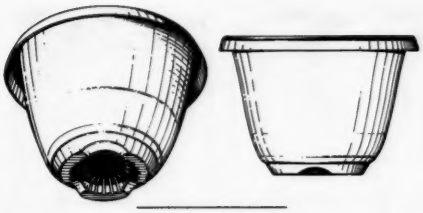
322,045
TABLETOP NOVELTY
W. Edward Bean, 416 Powder Mill Rd., Nashville, Tenn. 37205
Filed Jul. 6, 1989, Ser. No. 375,850
Term of patent 14 years
U.S. Cl. D11—131



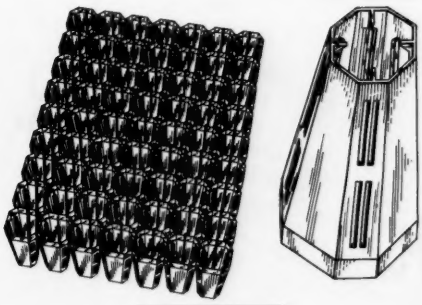
322,046
ILLUMINATED FLOWER POT
Larnell Woods, 7924 Thouron Ave., Philadelphia, Pa. 19150
Filed Jun. 2, 1989, Ser. No. 360,750
Term of patent 14 years
U.S. Cl. D11—144



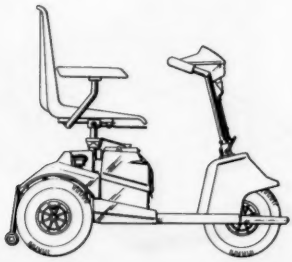
322,047
PLANTER
Anthony H. Wolfenden, Elwood, Australia, assignor to The Decor Corporation Pty. Ltd., Victoria, Australia
Filed Sep. 2, 1988, Ser. No. 241,123
Term of patent 14 years
U.S. Cl. D11—153



322,048
TRAY FOR GROWING PLANTS
Kari Saarinen, Iso-Vimma, Finland, assignor to Lännen Tehtaat Oy, Iso-Vimma, Finland
Filed Aug. 31, 1989, Ser. No. 401,169
Claims priority, application Finland, Apr. 18, 1989, 37389
Term of patent 14 years
U.S. Cl. D11—155



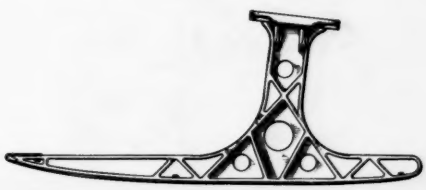
322,049
ARTICULATED THREE WHEEL VEHICLE
Trevor D. Doman, Wolverhampton; John R. Buttery, Newport, and Royston M. Gould, Warley, both of United Kingdom, assignors to Sunrise Medical Limited, Brierley Hill, England
Filed Jul. 28, 1988, Ser. No. 225,701
Term of patent 14 years
U.S. Cl. D12—85



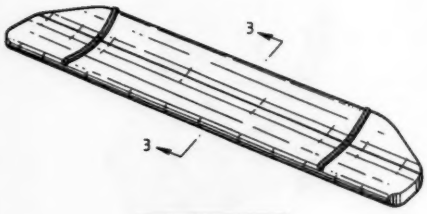
322,050
MOTORIZED FOUR WHEEL VEHICLE
Tetsuro Kataoka, Kawagoe, and Masato Yonai, Bunkyo, both of Japan, assignors to Honda Access Corp., Saitama, Japan
Filed Nov. 13, 1989, Ser. No. 435,581
The portion of the term of this patent subsequent to Dec. 3, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—1

322,051
MOTORIZED FOUR WHEEL VEHICLE
Tetsuro Kataoka, Kawagoe, and Masato Yonai, Tokyo, both of Japan, assignors to Honda Access Corp., Saitama, Japan
Filed Nov. 13, 1989, Ser. No. 435,582
The portion of the term of this patent subsequent to Dec. 3, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—1

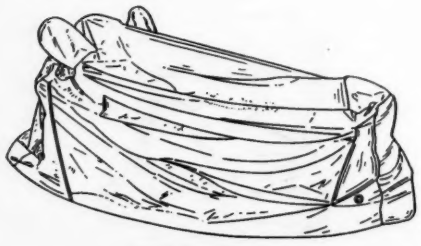
322,052
SKI SLED
Jonathan P. Prox, Bethel, Pa., assignor to Prox-Ski, Inc., Bethel, Pa.
Filed Feb. 22, 1989, Ser. No. 313,802
Term of patent 14 years
U.S. Cl. D12—9



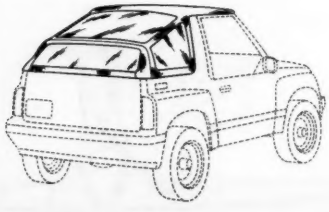
322,053
AEROFOIL FOR A WINDSCREEN WIPER ARM
John M. Bradley, Leighton House, 37 Leighton Street, Woburn, Bedfordshire MK17 9PH, United Kingdom
Filed May 9, 1990, Ser. No. 521,165
Term of patent 14 years
U.S. Cl. D12—155



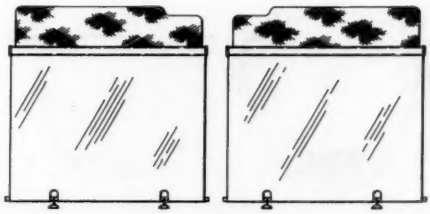
322,054
FOLDING COVER FOR A MOTORCYCLE
Klaus Reiter, Riednaunweg 13, A-6061 Aldrans, Austria
Filed Jul. 10, 1989, Ser. No. 377,215
Claims priority, application Austria, Jan. 12, 1989, 547942
Term of patent 14 years
U.S. Cl. D12—156



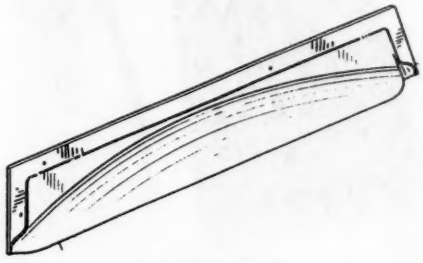
322,055
VEHICLE SOFT TOP
Douglas A. Bruce, Denver, and Tim J. Rosmerl, Longmont, both of Colo., assignors to Bestop, Inc., Broomfield Colo.
Filed Nov. 19, 1990, Ser. No. 615,641
Term of patent 14 years
U.S. Cl. D12—156



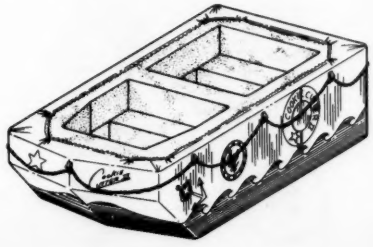
322,056
PAIR OF VISORS WITH EXTENDABLE SHADES FOR VEHICLES
Craig J. Widrig, 105 Continental Dr., Lockport, N.Y. 14094
Filed Mar. 10, 1989, Ser. No. 321,545
Term of patent 14 years
U.S. Cl. D12—191



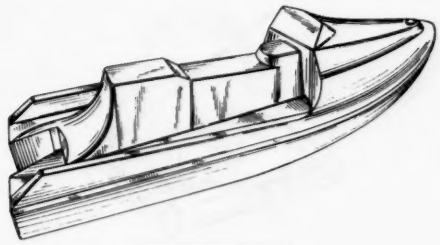
322,057
VEHICLE REAR SIDE WINDOW VISOR
Rodney E. Horwill, P.O. Box 171, Salisbury Qld. 4107, Australia
Filed Oct. 30, 1989, Ser. No. 428,642
Term of patent 14 years
U.S. Cl. D12—191



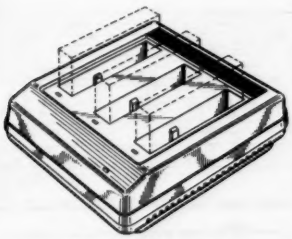
322,058
LIGHTWEIGHT FISHING BOAT
Edward Loper, Sr., 1015 Wilson Rd., Wilmington, Del. 19803
Filed Jan. 5, 1990, Ser. No. 461,460
Term of patent 14 years
U.S. Cl. D12—300



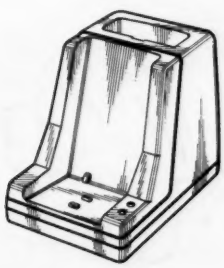
322,059
BOAT
Louis Chia, and Satoaki Omori, both of Anaheim, Calif., assignors to American Hovercraft & Sports, Inc., Anaheim, Calif.
Filed Jan. 5, 1990, Ser. No. 463,666
Term of patent 14 years
U.S. Cl. D12—307



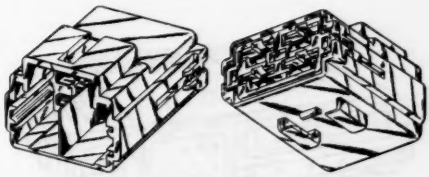
322,060
MULTIPLE BATTERY CHARGER
Masaaki Iino, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan
Filed Apr. 28, 1989, Ser. No. 344,854
Claims priority, application Japan, Dec. 6, 1988, 63-47381
Term of patent 14 years
U.S. Cl. D13—107



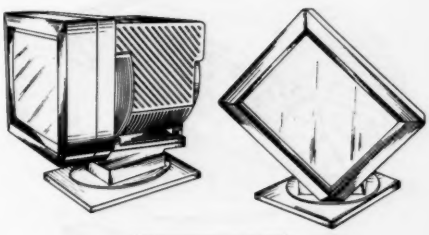
322,061
BATTERY CHARGER FOR A PORTABLE RADIO TELEPHONE
Katsuhito Watanabe, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Mar. 1, 1989, Ser. No. 317,666
Claims priority, application Japan, Sep. 12, 1988, 63-35748
Term of patent 14 years
U.S. Cl. D13—108



322,062
ELECTRICAL CONNECTOR HOUSING
Kenji Takenouchi; Toshihiko Makita, and Teruhisa Norizuki, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan
Filed Oct. 24, 1988, Ser. No. 262,002
Claims priority, application Japan, Apr. 28, 1988, 63-17052
Term of patent 14 years
U.S. Cl. D13—133

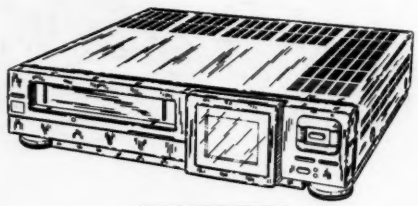


322,063
PIVOTABLE DISPLAY MONITOR
Terrell Oyama, Los Altos, Calif., assignor to Radius, Inc., San Jose, Calif.
Filed Dec. 1, 1989, Ser. No. 444,371
Term of patent 14 years
U.S. Cl. D14—113



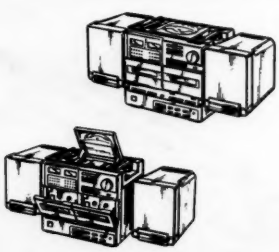
322,064
POSITION DETECTION STYLUS PEN FOR A GRAPHIC TABLET
Mohammed K. Chowdhree, Watford, and Hugo G. Poole, Knowle, both of England, assignors to Cherry Electrical Products Limited, Hertfordshire, England
Filed Sep. 6, 1989, Ser. No. 403,328
Claims priority, application United Kingdom, Mar. 7, 1989, 1057686
Term of patent 14 years
U.S. Cl. D14—114

322,065
COMBINED VIDEO CASSETTE RECORDER AND TELEVISION RECEIVER
Gerd H. Ziebarth, Krefeld, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 31, 1989, Ser. No. 430,447
Claims priority, application World Int. Prop. O., May 16, 1989, DM/013577
Term of patent 14 years
U.S. Cl. D14—129



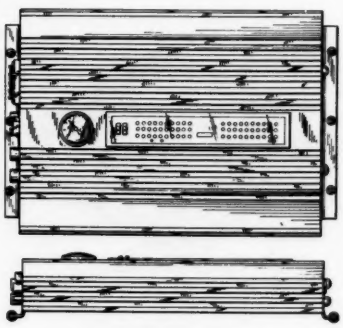
322,066
TELEPHONE OR SIMILAR ARTICLE
Ralph R. Pasinski, Sunnyvale, Calif., assignor to Nobell, Inc., Sunnyvale, Calif.
Filed Jan. 29, 1990, Ser. No. 471,817
Term of patent 14 years
U.S. Cl. D14—143

322,067
STEREO
Yoshiro Yamakawa, Tokyo, Japan, assignor to Yamaha Corporation, Japan
Filed Aug. 31, 1989, Ser. No. 400,976
Claims priority, application Japan, Mar. 8, 1989, 1-8393
Term of patent 14 years
U.S. Cl. D14—168



322,068
COMBINED AMPLIFIER AND RADIO TUNER
Yoshiro Yamakawa, Tokyo, Japan, assignor to Yamaha Corporation, Japan
Filed Dec. 1, 1989, Ser. No. 444,380
Claims priority, application Japan, Jun. 1, 1989, 1-20237
Term of patent 14 years
U.S. Cl. D14—168

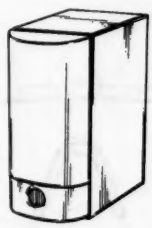
322,069
AUDIO AMPLIFIER OR SIMILAR ARTICLE
Isaac Seror, Flushing, N.Y., assignor to Kriss Electronic International Ltd., Flushing, N.Y.
Filed May 26, 1989, Ser. No. 357,439
Term of patent 14 years
U.S. Cl. D14—188



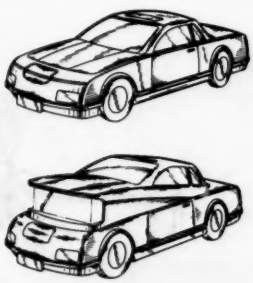
322,070
ACOUSTIC REFLECTOR HEADSET
Charles R. Kitch, 10430 Shady Trail, No. 103, Dallas, Tex. 75220
Filed Oct. 2, 1989, Ser. No. 415,523
Term of patent 14 years
U.S. Cl. D14—205

322,071
HEADPHONE
James T. Bergin, Rochdale, and Richard M. Urella, Princeton, both of Mass., assignors to David Clark Company Incorporated, Worcester, Mass.
Filed Jan. 27, 1989, Ser. No. 302,829
Term of patent 14 years
U.S. Cl. D14—206

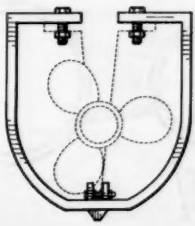
322,072
LOUDSPEAKER
Kentaro Yamamoto, Tokyo, Japan, assignor to Yamaha Corporation, Japan
Filed Oct. 3, 1989, Ser. No. 416,439
Claims priority, application Japan, Apr. 5, 1989, 1-12530
Term of patent 14 years
U.S. Cl. D14—214



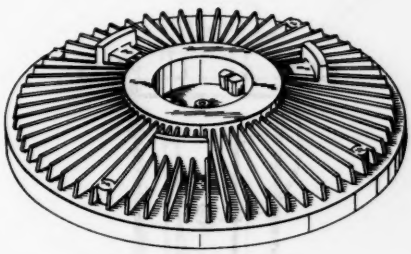
322,073
VIDEO CASSETTE REWINDER
Tsun H. Yeh, Hsinchu, Taiwan, assignor to Chwen Ho Chuang Co., Ltd., Hsinchu, Taiwan
Filed Jan. 24, 1989, Ser. No. 301,274
Claims priority, application Taiwan, Feb. 5, 1988, 77300695
Term of patent 14 years
U.S. Cl. D14—239



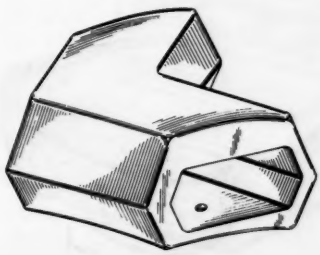
322,074
OUTBOARD PROPELLER GUARD
Gerald W. Hansen, 13617 E. Valleyway, Spokane, Wash. 99216
Filed Aug. 21, 1989, Ser. No. 396,010
Term of patent 14 years
U.S. Cl. D15—4



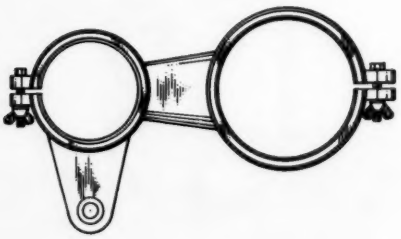
322,075
HOUSING OF A VISCOUS FAN DRIVE
James A. Jennings, Azle, and Neil T. Houters, Arlington, both of Tex., assignors to Dayco Products-Eaglemotive, Inc., Fort Worth, Tex.
Filed Apr. 18, 1989, Ser. No. 339,827
Term of patent 14 years
U.S. Cl. D15—5



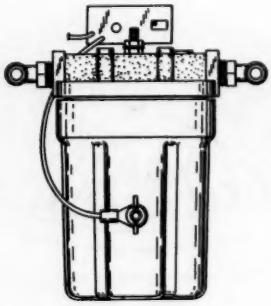
322,076
GROUND ENGAGING TREAD ELEMENT FOR A WHEEL OR ENDLESS TRACK
Phillip J. Rollinson, Myaree, Australia, assignor to Altrack Limited, Australia
Filed Dec. 7, 1988, Ser. No. 281,232
Claims priority, application Australia, Jun. 16, 1988, 1976/88
Term of patent 14 years
U.S. Cl. D15—28



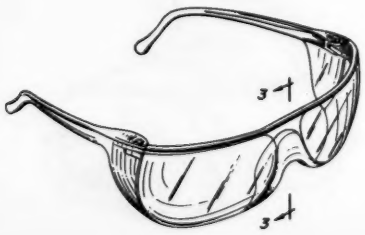
322,077
ROUTER BRACKET
Charles Downing, R.R. 1, Box 13, Sedan, Kans. 67361
Filed May 20, 1988, Ser. No. 196,972
Term of patent 14 years
U.S. Cl. D15—138



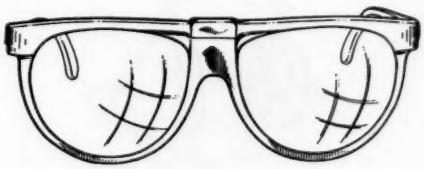
322,078
METAL RECOVERY SYSTEM
A. Norman Korb, Vancouver, Wash., assignor to Lab Systems, Inc., Portland, Oreg.
Filed Mar. 9, 1989, Ser. No. 322,042
Term of patent 14 years
U.S. Cl. D15—147



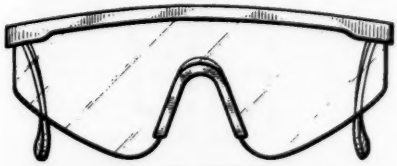
322,079
SAFETY EYEGLASSES
Raoul O. Desy, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Nov. 17, 1988, Ser. No. 272,684
Term of patent 14 years
U.S. Cl. D16—111



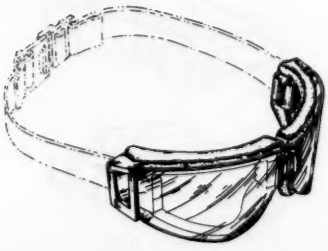
322,080
PAIR OF SUNGLASSES OR THE LIKE
Robert H. Ramp, Pittsford, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Nov. 23, 1988, Ser. No. 275,480
Term of patent 14 years
U.S. Cl. D16—102



322,081
SUNGLASSES
Ronald W. Longsdorf, West Hollywood, Calif., assignor to International Tropic-Cal, Inc., City of Commerce, Calif.
Filed Oct. 30, 1989, Ser. No. 429,183
Term of patent 14 years
U.S. Cl. D16—102

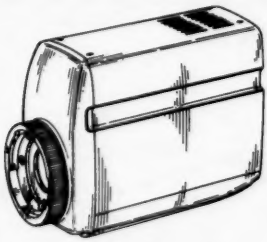


322,082
WATER SPORT GOGGLES
Maurice Bollé, Oyonnax, France, assignor to Etablissments Bollé S.N.C., Oyonnax, France
Filed Dec. 22, 1989, Ser. No. 454,834
Claims priority, application France, Jun. 23, 1989, 711
Term of patent 14 years
U.S. Cl. D16—102

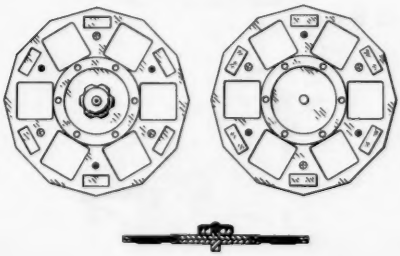


322,083
EYEGLASS DEVICE
Clyde E. McDannald, 57 Canterbury La., Wilton, Conn. 06897
Filed Feb. 28, 1990, Ser. No. 486,266
Term of patent 14 years
U.S. Cl. D16—102

322,084
VIDEO SURVEILLANCE CAMERA BODY
Masahiko Tabuchi, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Jun. 7, 1989, Ser. No. 362,833
Claims priority, application Japan, Dec. 8, 1988, 63-47660
Term of patent 14 years
U.S. Cl. D16—203



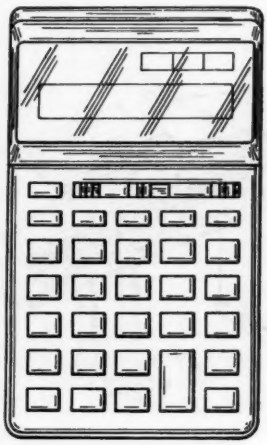
322,085
REVOLVING PHOTOGRAPHIC SLIDE HOLDER
Robert A. Canning, Rte. 1, 1900 Pecan, #20, Maxwell, Tex. 78656
Filed May 22, 1989, Ser. No. 354,680
Term of patent 14 years
U.S. Cl. D16—236



322,086
ELECTRONIC PIANO
Yasuo Yamawaki, and Kazuyuki Mizushima, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Shizuoka, Japan
Filed Nov. 15, 1988, Ser. No. 271,766
Claims priority, application Japan, May 17, 1988, 63-19386
The portion of the term of this patent subsequent to Oct. 1, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D17—7

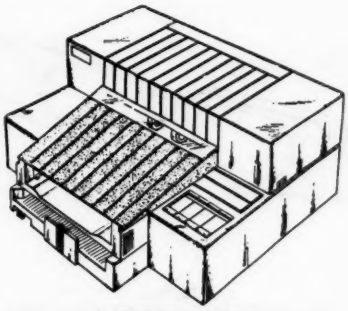
322,087
TYPEWRITER
Robert L. Kasprzycki, Pompey, N.Y., assignor to Smith Corona Corporation, Cortland, N.Y.
Filed Mar. 20, 1989, Ser. No. 325,717
Term of patent 14 years
U.S. Cl. D18—1

322,088
CALCULATOR
Masaji Sawada, and Koji Nishida, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed May 10, 1989, Ser. No. 350,072
Claims priority, application Japan, Nov. 22, 1988, 63-45566
Term of patent 14 years
U.S. Cl. D18—7

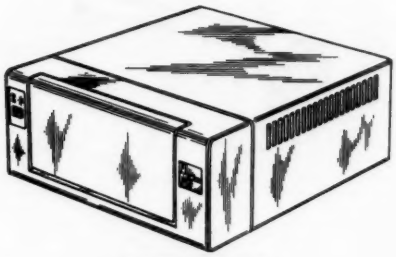


322,089
ELECTRONIC GRAND PIANO
Dennis J. Orris, 1365 Dorothy Dr., Clearwater, Fla. 34624
Filed May 22, 1989, Ser. No. 355,395
Term of patent 14 years
U.S. Cl. D17—8

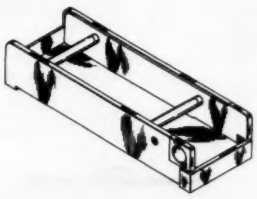
322,090
ACTIVE DROP INK-JET PRINTER
Donald R. McClelland, Brush IPrairie; Donald R. Bloyer; Richard E. Berriman, both of Vancouver, all of Wash., and Robin W. C. Chu, San Francisco, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Filed Nov. 3, 1987, Ser. No. 117,126
Term of patent 14 years
U.S. Cl. D18—55



322,091
LASER BEAM PRINTER
Hiroyuki Tokuda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 12, 1988, Ser. No. 143,149
Claims priority, application Japan, Jul. 14, 1987, 62-28829
Term of patent 14 years
U.S. Cl. D18—54

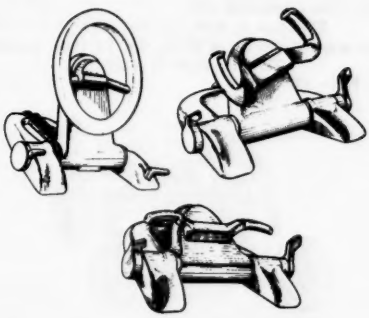


322,092
BINDER
Satoshi Mizutani, and Nakada Hiroaki, both of Tokyo, Japan, assignors to King Jim Co., Ltd., Tokyo, Japan
Filed Sep. 7, 1989, Ser. No. 403,807
Term of patent 14 years
U.S. Cl. D19—32

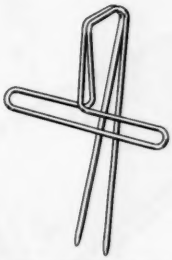


322,093
POCKET CLIP
Dieter Eylers, Idar-Oberstein, Fed. Rep. of Germany, assignor to Gottlieb Roll GmbH & Co., Idar-Oberstein, Fed. Rep. of Germany
Filed Sep. 5, 1989, Ser. No. 403,152
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1989, 89016394
Term of patent 14 years
U.S. Cl. D19—56

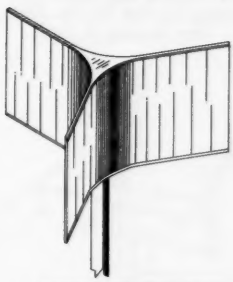
322,094
VEHICLE CONTROL SIMULATOR
Wynford P. Holloway, Cardiff, United Kingdom, assignor to Creative Devices Research Ltd., Gwent, England
Filed Oct. 5, 1988, Ser. No. 255,521
Claims priority, application United Kingdom, Apr. 5, 1988, 1049705; May 27, 1988, 1051036; May 27, 1988, 1051037
Term of patent 14 years
U.S. Cl. D19—63



322,095
BOOK CLIP
Jose L. G. Rivera, Rio Nasas, Mexico, assignor to Universal Network, Inc., The Woodlands, Tex.
Filed Feb. 23, 1989, Ser. No. 314,588
Term of patent 14 years
U.S. Cl. D19—65



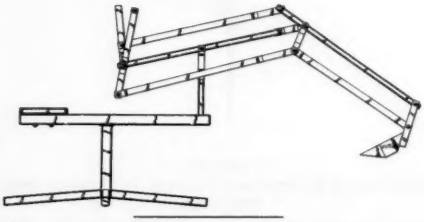
322,096
ROTATABLE SIGN
Russell S. Adams, P.O. Box 607, Raceland, La. 70394
Filed Jan. 3, 1989, Ser. No. 293,475
Term of patent 14 years
U.S. Cl. D20—21



322,097
WALL DISPLAY HOLDER FOR COMIC BOOKS AND THE LIKE
Wayne Fritz, 11129 Decator Plaza #522, Omaha, Nebr. 68154
Filed Jul. 31, 1989, Ser. No. 386,962
Term of patent 14 years
U.S. Cl. D20—42

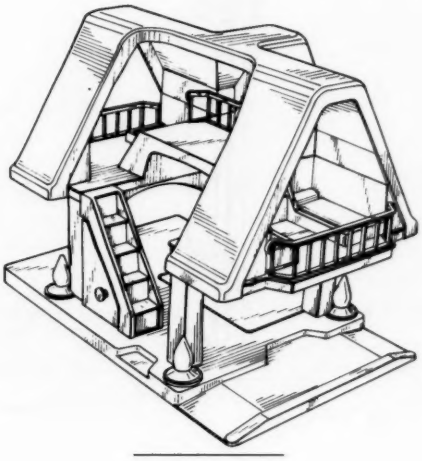
322,098
HAND-HELD ELECTRONIC GAME OR THE LIKE
Kazumi Kitaue, Kobeshi, Japan, assignor to Konami Industry Co., Ltd., Japan
Filed May 1, 1989, Ser. No. 346,611
Term of patent 14 years
U.S. Cl. D21—13

322,099
TOY BACK HOE
Gerald Mast, 7749 S. Sconce Rd., Canby, Oreg. 97013
Filed Sep. 20, 1989, Ser. No. 409,872
Term of patent 14 years
U.S. Cl. D21—71

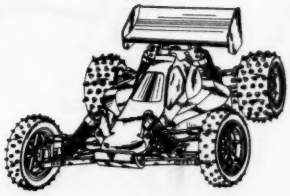


322,100
GYRO TOP
Paul L. Brown, 505 S. Olive Way, Denver, Colo. 80224, and Richard C. Levy, P.O. Box 34828, Bethesda, Md. 20817
Filed Aug. 28, 1989, Ser. No. 399,290
Term of patent 14 years
U.S. Cl. D21—95

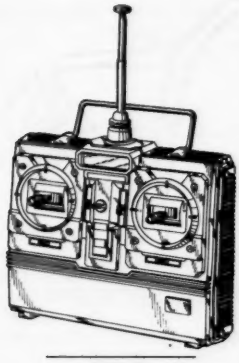
322,101
TOY PLAYHOUSE
James F. Mariol, Cincinnati, Ohio, assignor to The Little Tikes Company, Hudson, Ohio
Filed Jan. 11, 1990, Ser. No. 463,661
Term of patent 14 years
U.S. Cl. D21—114



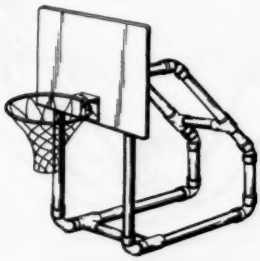
322,102
TOY CAR
Shigeki Araki, Shizuoka, Japan, assignor to Kabushiki Kaisha Tamiya Mokei, Shizuoka, Japan
Filed Nov. 6, 1989, Ser. No. 431,852
Claims priority, application Japan, Sep. 12, 1989, 1-33159
Term of patent 14 years
U.S. Cl. D21—137



322,103
REMOTE CONTROL UNIT
Naoichi Kohno, Mobara, Japan, assignor to Futaba Denshi, Mobara, Japan
Filed Jun. 13, 1988, Ser. No. 205,795
Claims priority, application Japan, Apr. 18, 1988, 63-15724
Term of patent 14 years
U.S. Cl. D21—141

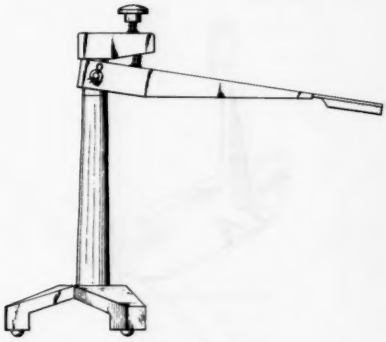


322,104
NET SUPPORT
Gary K. Sephton, 690 Island Way, #906, Clearwater, Fla. 34630
Filed Dec. 21, 1989, Ser. No. 454,127
Term of patent 14 years
U.S. Cl. D21—201

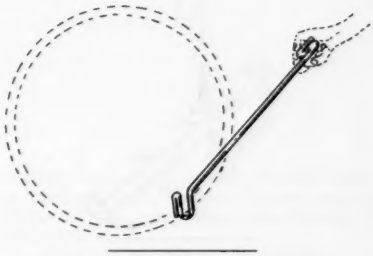


322,105
BALL
Hansan Ma, Cape Elizabeth, Me., assignor to Tonka Corporation, Minnetonka, Minn.
Filed Jul. 6, 1989, Ser. No. 376,358
Term of patent 14 years
U.S. Cl. D21—205

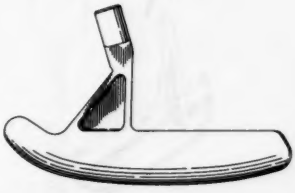
322,106
FOOTBALL KICKING TEE
Martin K. Rambacher, Maple Grove Rd., Bemus Point, N.Y. 14712
Filed May 25, 1989, Ser. No. 356,935
Term of patent 14 years
U.S. Cl. D21—209



322,107
HOOP ROLLER
Zissis S. Zoghopoulos, Rte. 2, Box 117, Luverne, Ala. 36049
Filed Jul. 9, 1990, Ser. No. 549,699
Term of patent 14 years
U.S. Cl. D21—210

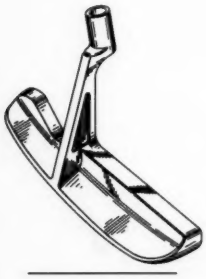


322,108
GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Jul. 19, 1988, Ser. No. 221,445
The portion of the term of this patent subsequent to Mar. 28, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—217



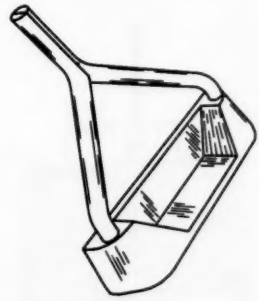
322,109
GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Aug. 11, 1988, Ser. No. 230,988
The portion of the term of this patent subsequent to Dec. 3, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—217

322,110
GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Aug. 17, 1988, Ser. No. 233,114
The portion of the term of this patent subsequent to May 3, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—217

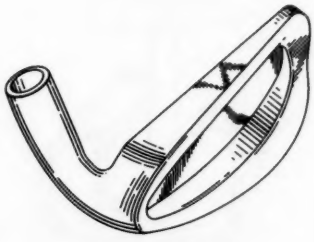


322,111
PUTTER TYPE GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Dec. 28, 1988, Ser. No. 290,906
The portion of the term of this patent subsequent to Dec. 3, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—217

322,112
COMBINED GOLF PUTTER HEAD AND SPLIT HOSEL
Lawrence G. Kastenhuber, 1421 N. Geyer Rd., Kirkwood, Mo. 63122
Filed Mar. 2, 1989, Ser. No. 317,786
Term of patent 14 years
U.S. Cl. D21—217

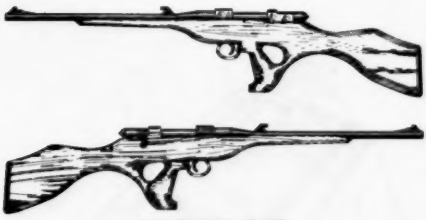


322,113
IRON TYPE GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Oct. 13, 1988, Ser. No. 257,048
The portion of the term of this patent subsequent to Dec. 3, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—220

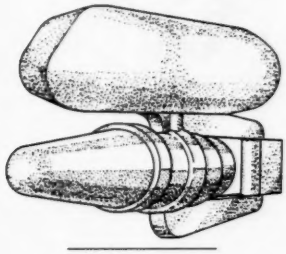


322,114
IRON TYPE GOLF CLUB HEAD
Anthony J. Antonious, 205 E. Joppa Rd., Towson, Md. 21204
Filed Dec. 28, 1988, Ser. No. 290,905
The portion of the term of this patent subsequent to Dec. 3, 2005, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—220

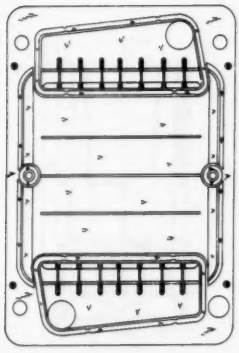
322,115
RIFLE
Duane L. Custred, R.D. 1, Box 395A, Port Matilda, Pa. 16870
Filed Mar. 24, 1989, Ser. No. 328,145
Term of patent 14 years
U.S. Cl. D22—103



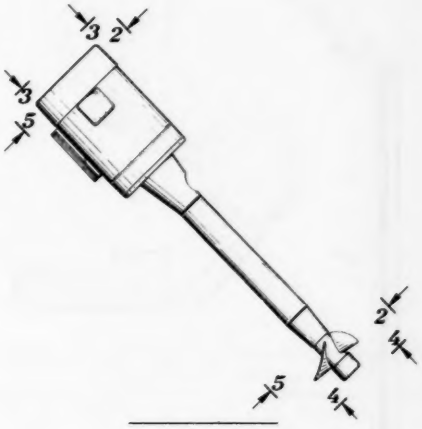
322,116
SELF-POWERED BAIT TROLLER
Wilfred J. Blease, Merrimack, N.H., assignor to Pioneer Plastics, Inc., Greenville, N.H.
Filed Jul. 28, 1989, Ser. No. 386,862
Term of patent 14 years
U.S. Cl. D22—134



322,117
FILTER PLATE
Henry B. Kopf, 108 Coatbridge Cir., Cary, N.C. 27511
Filed Sep. 1, 1989, Ser. No. 403,148
The portion of the term of this patent subsequent to Jan. 30, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D23—209

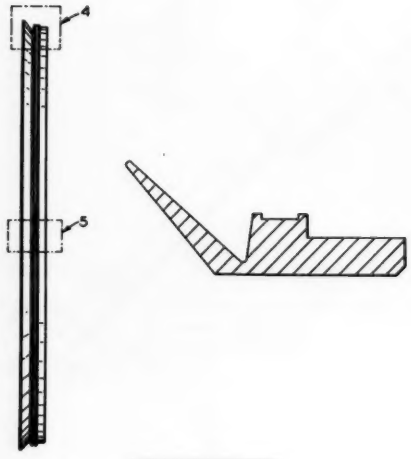


322,118
LIQUID AERATOR
Peter S. Gross, Plymouth, Minn., assignor to Aeromix Systems, Incorporated, Minneapolis, Minn.
Filed Aug. 21, 1989, Ser. No. 396,468
Term of patent 14 years
U.S. Cl. D23—213

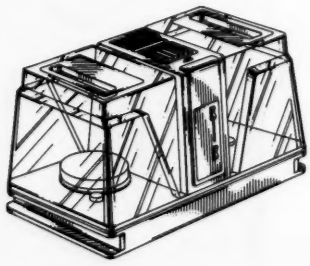


322,119
COMBINED HAND SHOWER AND SUPPORT
Andreas Haug, and Thomas Schönherr, both of Stuttgart, Fed. Rep. of Germany, assignors to Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany
Filed Dec. 14, 1988, Ser. No. 284,454
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1988, MR13610B
Term of patent 14 years
U.S. Cl. D23—223

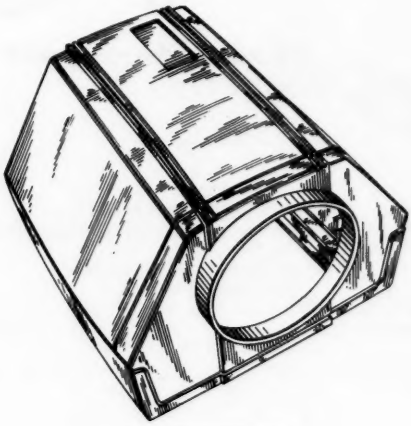
322,120
SEALING RING
Frank du Gay, Basel, Switzerland, assignor to Forsheda AB, Forsheda, Sweden
Continuation of Ser. No. 893,667, Aug. 6, 1986, abandoned. This application Oct. 29, 1990, Ser. No. 605,149
Claims priority, application Sweden, Feb. 10, 1986, 86-0336
Term of patent 14 years
U.S. Cl. D23—269



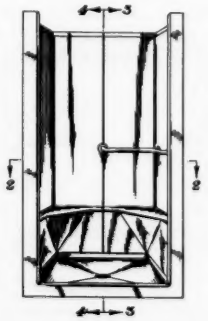
322,121
PORTABLE HUMIDIFIER
Bernard Chiu, Ashland, Mass., assignor to Duracraft Corporation, Sudbury, Mass.
Filed May 9, 1990, Ser. No. 520,922
Term of patent 14 years
U.S. Cl. D23—356



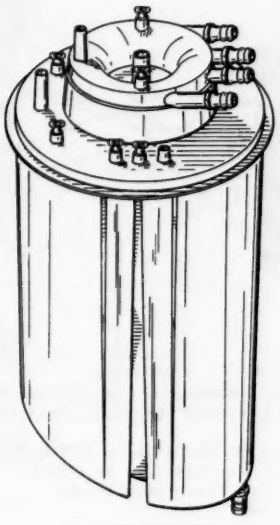
322,122
HUMIDIFIER CASING
Timothy L. Guetersloth, Madison, and Roger M. Pasch, Windsor, both of Wis., assignors to Research Products Corporation, Madison, Wis.
Filed Mar. 20, 1989, Ser. No. 325,503
Term of patent 14 years
U.S. Cl. D23—357



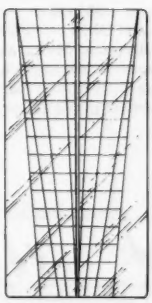
322,123
SHOWER ENCLOSURE
Lee A. Smith, 3901 Foxcroft Rd., Charlotte, N.C. 28211
Filed Sep. 7, 1988, Ser. No. 241,139
Term of patent 14 years
U.S. Cl. D23—283



322,124
AUTOTRANSFUSION UNIT WITH VACUUM REGULATION CARDIOTOMY RESERVOIR
Leo J. Lichte, Riverside, and Jack W. Brown, Santa Ana, both of Calif., assignors to Gish Biomedical Inc., Santa Ana, Calif.
Filed Jul. 13, 1989, Ser. No. 379,289
Term of patent 14 years
U.S. Cl. D24—117

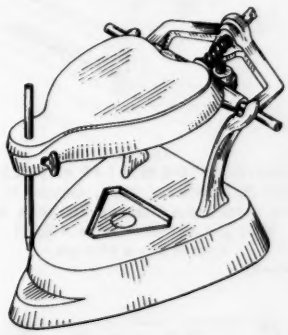


322,125
X-RAY LINE FINDER OR SIMILAR ARTICLE
Thomas R. Dorsey, H.C. 1, Box 659, Gloucester Point, Va. 23602
Filed Feb. 13, 1989, Ser. No. 309,719
Term of patent 14 years
U.S. Cl. D24—140



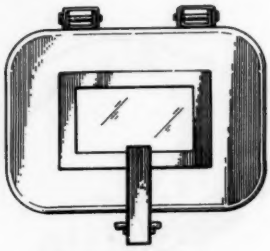
322,126
HEARING AID
Okke O. van Mourik, Delft, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 27, 1989, Ser. No. 441,926
Claims priority, application Netherlands, Jun. 27, 1989, 64479-01
Term of patent 14 years
U.S. Cl. D24—174

322,127
COMBINED DENTAL ARTICULATOR AND DUAL RECESSED MAGNETS
Paul D. Raskin, 1824 Avondale Ave., Sacramento, Calif. 95826
Filed Mar. 12, 1990, Ser. No. 491,654
Term of patent 14 years
U.S. Cl. D24—182

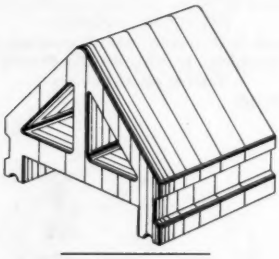


322,128
HOLDER FOR BABY BOTTLE OR SIMILAR ARTICLE
Ben Martinez, Jr., 8612 Monica Ave., Orangevale, Calif. 95662
Filed Feb. 24, 1989, Ser. No. 315,041
Term of patent 14 years
U.S. Cl. D24—199

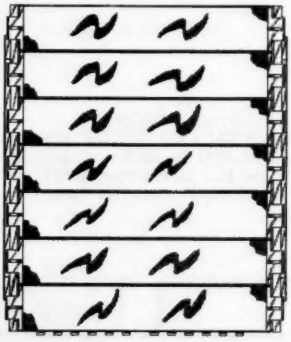
322,129
VIEWING WINDOW
Chozo Matsumoto, Mie, and Tsuyoshi Yonezawa, Osaka, both of Japan, assignors to Tsubakimoto Bulk Systems Corporation, Osaka, Japan
Filed May 18, 1989, Ser. No. 354,697
Term of patent 14 years
U.S. Cl. D25—52



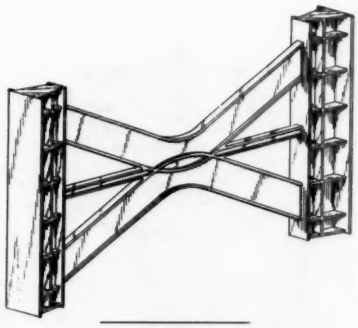
322,130
WALL COPING
Adolf F. Becker, 438 Dune Cir., Kailua, Hi. 96734
Filed May 4, 1989, Ser. No. 348,465
Term of patent 14 years
U.S. Cl. D25—58



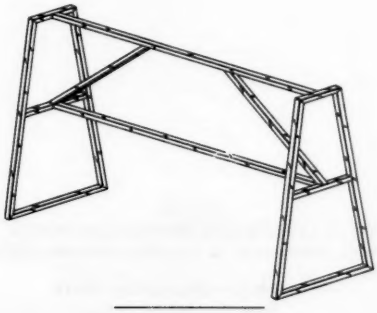
322,131
PLATFORM OR SIMILAR ARTICLE
Jon H. Eickhoff, Kalamazoo, Mich., assignor to Ronningen Research & Development Company, Vicksburg, Mich.
Filed Dec. 6, 1989, Ser. No. 446,917
Term of patent 14 years
U.S. Cl. D25—62



322,132
CROSS BRACE FOR A PLATFORM ASSEMBLY
Jon H. Eickhoff, Kalamazoo, Mich., assignor to Ronningen Research & Development Company, Vicksburg, Mich.
Filed Dec. 6, 1989, Ser. No. 446,918
Term of patent 14 years
U.S. Cl. D25—62

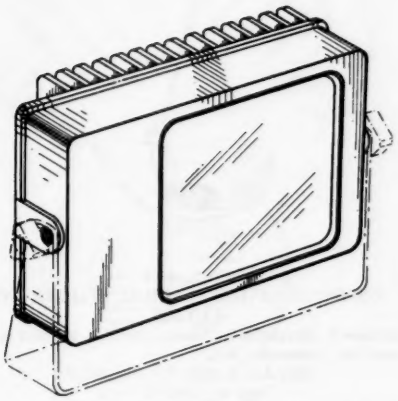


322,133
SAWHORSE
Christopher C. Corneau, 26123 Nagel, Roseville, Mich. 48066, and John J. Wasolek, 4440 Fenton Rd., Hartland, Mich. 48029
Continuation of Ser. No. 204,776, Jun. 10, 1988. This application Mar. 1, 1990, Ser. No. 488,802
Term of patent 14 years
U.S. Cl. D25—67

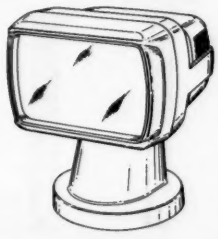


322,134
PLATFORM SUPPORT
Jon H. Eickhoff, Kalamazoo, Mich., assignor to Ronningen Research & Development Company, Vicksburg, Mich.
Filed Dec. 6, 1989, Ser. No. 446,919
Term of patent 14 years
U.S. Cl. D25—68

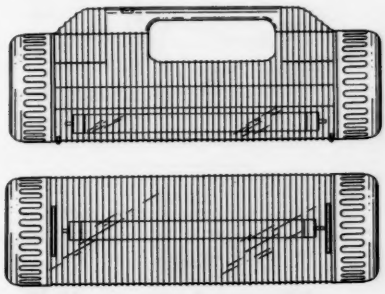
322,135
INFRARED LUMINAIRE FOR SECURITY SYSTEM OR THE LIKE
Julian J. Wierzbicki, Peabody, and James N. Lester, Essex, both of Mass., assignors to GTE Products Corporation, Danvers, Mass.
Filed May 30, 1989, Ser. No. 359,055
Term of patent 14 years
U.S. Cl. D26—24



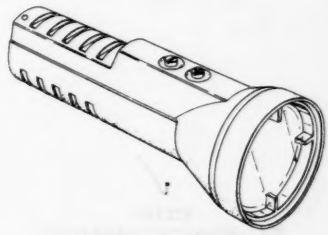
322,136
REMOTE CONTROLLED SEARCHLIGHT FOR VEHICLE, BOAT, OR THE LIKE
Susumu Shima; Hideto Hirose, both of Tokyo; Masaaki Ishii, Urayasu, and Kohnosuke Iijima, Tokyo, all of Japan, assignors to Sanshin Dengu Manufacturing Co., Ltd., Japan
Filed Jul. 31, 1989, Ser. No. 387,643
Term of patent 14 years
U.S. Cl. D26—28



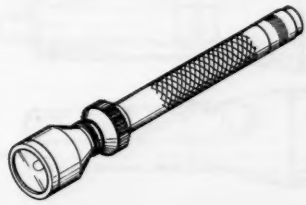
322,137
WATER RESISTANT MULTI-FUNCTION LANTERN
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Jun. 15, 1989, Ser. No. 366,418
Claims priority, application United Kingdom, Dec. 22, 1988, 1055901
Term of patent 14 years
U.S. Cl. D26—42



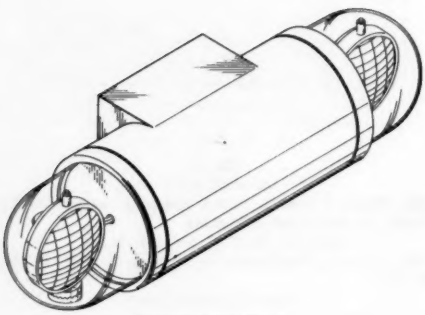
322,138
FLASHLIGHT
Philip Davies, Chiswick, United Kingdom, assignor to Ever Ready Limited, London, England
Filed Apr. 20, 1987, Ser. No. 40,232
Claims priority, application United Kingdom, Oct. 27, 1986, 1037660
Term of patent 14 years
U.S. Cl. D26—49



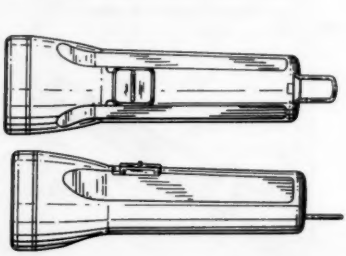
322,139
FLASHLIGHT
Howard Wang, No. 7, Alley 14, Lane 64, Ching Ping Rd., Chung Ho City, Taipei Hsien, Taiwan
Filed Jan. 2, 1990, Ser. No. 459,572
Term of patent 14 years
U.S. Cl. D26—49



322,140
TWIN HEAD EMERGENCY LIGHT
Ron Dacanay, Schaumburg, and Geno D'Ercoli, Rolling Meadows, both of Ill., assignors to Cooper Industries, Inc., Houston, Tex.
Filed Feb. 13, 1990, Ser. No. 479,599
Term of patent 14 years
U.S. Cl. D26—85

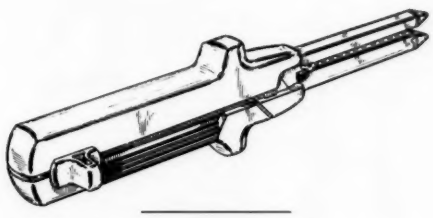


322,141
WATERPROOF FLASHLIGHT
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Jan. 8, 1990, Ser. No. 461,790
Claims priority, application United Kingdom, Oct. 13, 1989, 2001669
Term of patent 14 years
U.S. Cl. D26—49

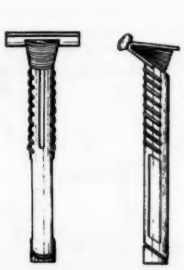


322,142
HANGING CEILING LIGHT
Ernesto Gismondi, Milan, Italy, assignor to Artemide S.p.A., Montenapoleone, Italy
Filed Jul. 7, 1989, Ser. No. 377,008
Claims priority, application Italy, Jan. 10, 1989, 52806/89[U]
Term of patent 14 years
U.S. Cl. D26—88

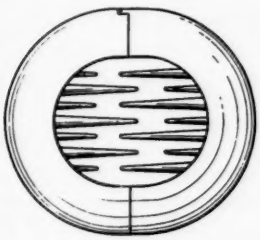
322,143
COMBINED LINEAR SURGICAL STAPLER AND CUTTER
Lawrence E. Spreckelmeier, Cincinnati, Ohio, assignor to Ethicon, Inc., Somerville, N.J.
Filed Jun. 5, 1989, Ser. No. 361,540
Term of patent 14 years
U.S. Cl. D24—145



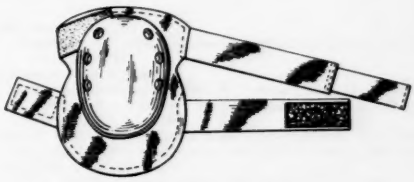
322,144
SAFETY RAZOR
Eric A. Schneider, Philadelphia, Pa., assignor to Bressler Group, Inc., Philadelphia, Pa.
Filed Jun. 12, 1989, Ser. No. 366,892
Term of patent 14 years
U.S. Cl. D28—46



322,145
BUN HAIRCLIP
Henri Coignard, Jaunay Clan, France, assignor to Etablissements Delsol, Paris, France
Filed Feb. 6, 1989, Ser. No. 306,655
Claims priority, application France, Sep. 8, 1988, 88 5592
Term of patent 14 years
U.S. Cl. D28—42



322,146
KNEEPAD
William S. Anderson, Santa Rosa, Calif., assignor to STX, Inc., Santa Rosa, Calif.
Filed Oct. 23, 1987, Ser. No. 111,707
Term of patent 14 years
U.S. Cl. D29—10



322,147
TOY FOR DOG OR SIMILAR ARTICLE
Judy L. Hall, P.O. Box 24283, Ft. Worth, Tex. 76124
Filed May 14, 1987, Ser. No. 49,449
Term of patent 14 years
U.S. Cl. D30—160

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF DECEMBER, 1991

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A & E Products Group, a division of Carlisle Plastics, Inc.: *See*—
Kolton, Chester; and Spater, Stuart S., 5,069,373, Cl. 223-85.000.

A. H. Robins Company, Incorporated: *See*—
Jagdmann, Gunnar E., Jr.; and Munson, Harry R., Jr., 5,070,095, Cl. 514-305.000.
Teng, Lina C.; Walsh, David A.; and Shanklin, James R., Jr., 5,070,087, Cl. 514-212.000.

Abatement Technologies: *See*—
Travis, Terrell; Shagott, David; Kruse, Gary; Sutherland, Daniel; and Harber, Blair, Jr., 5,069,691, Cl. 55-126.000.

ABB Atom AB: *See*—
Engdahl, Goran; and Wikstrom, Dag, 5,070,316, Cl. 335-215.000.

ABB Stal AB: *See*—
Ekbom, Ragnar, 5,069,866, Cl. 419-6.000.

Abbey, Woodbury, III: *See*—
Alexander, Richard M.; and Abbey, Woodbury, III, 5,070,436, Cl. 362-108.000.

Abbott, Curtis, to Xerox Corporation. Modifying text data to change features in a region of text. 5,070,478, Cl. 364-419.000.

Abbott, Roy W.: *See*—
Wachs, Fred B., III; and Abbott, Roy W., 5,069,043, Cl. 62-305.000.

Abdulally, Iqbal F.: *See*—
Gorzegno, Walter P.; Abdulally, Iqbal F.; Phalen, John W.; and Touma, Alfred S., 5,069,170, Cl. 122-4.00D.

Abe, Koichi: *See*—
Okazaki, Iwao; Abe, Koichi; and Nakajima, Shoji, 5,069,962, Cl. 428-323.000.

Abe, Toru: *See*—
Miyagishi, Tetsuya; Abe, Toru; and Kuroiwa, Takaaki, 5,069,069, Cl. 73-335.000.

Aboul-Nasr, Osman T., to Polysar Financial Services S.A. Distributor for a devolatilizer. 5,069,750, Cl. 159-2.001.

Abrams, Eve M., to United States of America, Administrator, National & Space Administration. Device for applying constant pressure to a surface. 5,068,951, Cl. 29-110.500.

Abrams, John S.; and Van Dyke, Robert E., to Schering Corporation. Immunochemical assay for human granulocyte-macrophage colony stimulating factor. 5,070,013, Cl. 435-7.500.

Aburaya, Toshio: *See*—
Yonekawa, Takashi; Buma, Shuuichi; Aburaya, Toshio; Sato, Kunihito; Kawanishi, Masaki; Hamada, Toshiaki; and Tagawa, Shinichi, 5,069,475, Cl. 280-707.000.

Acer Incorporated: *See*—
Wu, Dennis, 5,070,330, Cl. 341-26.000.

Acker, Fred, to Kleer-Vu Plastics Corporation. Looseleaf binder having a removable protective envelope and method of making same. 5,069,568, Cl. 402-73.000.

ACS Communications, Inc.: *See*—
Lynn, Dwight D., 5,070,527, Cl. 379-395.000.

Actel Corporation: *See*—
McCollum, John L.; and Chen, Shih-Ou, 5,070,384, Cl. 357-51.000.

Active Voice, Inc.: *See*—
Richmond, Robert L.; and Robinson, Michael, 5,070,526, Cl. 379-372.000.

ADA Technologies, Inc.: *See*—
Durham, Michael D.; Stedman, Donald H.; Ebner, Timothy G.; and Burkhardt, Mark R., 5,070,246, Cl. 250-373.000.

Adamisin, Dennis A.: *See*—
Shust, Deborah J.; Selzer, Robert J.; and Adamisin, Dennis A., 5,069,538, Cl. 359-871.000.

Adams, Frederick J., to TRW Cam Gears Limited. Vehicle power assisted steering system. 5,069,301, Cl. 180-143.000.

Adams, Jurgen: *See*—
Hautvast, Heinz-Josef; Adams, Jurgen; and Sieber, Isa, 5,069,624, Cl. 439-16.000.

Adger Kogyo Co., Ltd.: *See*—
Iijima, Zenshiro, 5,070,066, Cl. 503-201.000.

Advanced Cooling Technology, Inc.: *See*—
Wachs, Fred B., III; and Abbott, Roy W., 5,069,043, Cl. 62-305.000.

Advanced Elastomer Systems, L.P.: *See*—
Dumbauld, Garry L., 5,070,111, Cl. 521-82.000.

Advanced Magnetics Inc.: *See*—
Groman, Ernest V.; Josephson, Lee; and Lewis, Jerome M., 5,069,216, Cl. 128-653.400.

Aeroquip Corporation: *See*—
Bauer, David M.; and Gilbert, David L., 5,069,631, Cl. 439-159.000.

Agarwal, Vinod K., to Xerox Corporation. Low lateral force drive roller system. 5,070,365, Cl. 355-212.000.

Agency of Industrial Science and Technology: *See*—
Sato, Masa-aki; and Yamauchi, Aizo, 5,069,823, Cl. 252-518.000.
Takasu, Hiroshi; Arase, Susumu; Yokota, Junichiro; and Nakayama, Kazuo, 5,069,855, Cl. 264-235.000.

Agfa Gevaert AG: *See*—
Krafft, Werner; Helling, Gunter; and Matschke, Gunter, 5,070,006, Cl. 430-531.000.

Agostinelli, John A.: *See*—
Mir, Jose M.; Agostinelli, John A.; Peterson, David L.; Paz-Pujalt, Gustavo R.; Higberg, Brian J.; and Rajeswaran, Gopalan, 5,070,072, Cl. 505-1.000.

Agrawal, Rakesh, to Air Products and Chemicals, Inc. Triple distillation column nitrogen generator with plural reboiler/condensers. 5,069,699, Cl. 62-24.000.

Ahlefeld, Marvin A. Boat engine winterizing device. 5,069,259, Cl. 141-98.000.

Ahlstone, Arthur G.: *See*—
Short, David E.; Ahlstone, Arthur G.; and Valka, William A., 5,069,287, Cl. 166-339.000.

Ahuna, Stephen K. Pet dish. 5,069,166, Cl. 119-61.000.

Aicello Chemical Co., Ltd.: *See*—
Toyonishi, Shigekazu; and Nakajima, Takashi, 5,070,126, Cl. 524-224.000.

Air-Lock, Incorporated: *See*—
MacKendrick, Robert R.; and Gonsalves, Mario, 5,068,919, Cl. 2-2.10A.

Air Products and Chemicals, Inc.: *See*—
Agrawal, Rakesh, 5,069,699, Cl. 62-24.000.
Henderson, Philip B.; Coe, Charles G.; Fowler, Donald E.; and Benson, Montford S., 5,069,690, Cl. 55-67.000.

Air Way Automation, Inc.: *See*—
Albright, Clare E., 5,069,362, Cl. 221-131.000.

AISA S.p.A.: *See*—
Barozzi, Gian P., 5,069,195, Cl. 125-23.010.

Aisin A W Kabushiki Kaisha: *See*—
Taniguchi, Takao; Tsukamoto, Kazumasa; Hayabuchi, Masahiro; and Noda, Koji, 5,069,657, Cl. 475-283.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Yabuno, Ryohei; and Takeda, Shin, 5,068,964, Cl. 29-892.300.
Yonekawa, Takashi; Buma, Shuuichi; Aburaya, Toshio; Sato, Kunihito; Kawanishi, Masaki; Hamada, Toshiaki; and Tagawa, Shinichi, 5,069,475, Cl. 280-707.000.

Ajinomoto Co., Inc.: *See*—
Takeba, Go; and Tanaka, Osamu, 5,069,707, Cl. 71-86.000.
Yamada, Yasuhiro; Sakuda, Shohei; and Takayama, Seiji, 5,070,191, Cl. 536-22.000.
Yarita, Kenichi; Tada, Takahisa; and Kasatani, Ryuichiro, 5,070,208, Cl. 548-494.000.

Akagiri, Kenzo: *See*—
Iwahashi, Naoto; Akagiri, Kenzo; and Setoguchi, Hiromi, 5,070,515, Cl. 375-27.000.

Akahori, Kiyokazu: *See*—
Kawai, Hideki; Akahori, Kiyokazu; and Nagano, Hirosaku, 5,070,181, Cl. 528-353.000.

Akaki, Yuu: *See*—
Seko, Kenji; Akaki, Yuu; Iwasawa, Naozumi; and Kondo, Toshio, 5,070,000, Cl. 430-280.000.

Akebono Brake Industry Co., Ltd.: *See*—
Maehara, Toshifumi, 5,069,508, Cl. 303-113.0TR.

Akebono Research and Development Centre Ltd.: *See*—
Maehara, Toshifumi, 5,069,508, Cl. 303-113.0TR.

Akerman, Mark J.: *See*—
Reinson, Lorne R.; Akerman, Mark J.; and Klippenstein, John, 5,069,494, Cl. 294-1.200.

Akkapeddi, Murali K.: *See*—
Glans, Jeffrey H.; and Akkapeddi, Murali K., 5,070,152, Cl. 525-397.000.

Akselrud, Vitaly: *See*—
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Aktiebolaget Bofors: *See*—
Johansson, Sven-Eric; Melhus, Ulf; and Selin, Lennart, 5,069,135, Cl. 102-380.000.

Akzo N.V.: *See*—
Buter, Roelof, 5,070,135, Cl. 524-504.000.

Al-Janby, Harith: *See*—
Fong, Rosamaria; Al-Janby, Harith; and Dahn, Jeffrey R., 5,069,683, Cl. 29-623.100.

Al-Sabih, Adel K. Radial piston rotary device and drive mechanism. 5,069,604, Cl. 418-36.000.

Alba, Emilio C., to Gibbs & Hill Espanola. Cibernetic fountain apparatus and valve therefor. 5,069,387, Cl. 239-18.000.

Albright, Clare E., to Air Way Automation, Inc. Escapement manifold for fastener feeding machines and the like. 5,069,362, Cl. 221-131.000.

Alcatel N. V.: *See*—
Kleine-Altekamp, Harald, 5,070,497, Cl. 370-14.000.

Alcatel N.V.: *See—*
Kersten, Peter; and Hanisch, Helmut, 5,069,517, Cl. 385-130.000.

Alcatel Satmam: *See—*
Haroutel, Jean-claude, 5,069,299, Cl. 177-25.150.

Alcon Laboratories, Inc.: *See—*
York, Billie M., Jr., 5,070,100, Cl. 514-387.000.

Alcott, William D., III: *See—*
Doyle, Findley C., Jr.; and Alcott, William D., III, 5,070,452, Cl. 364-401.000.

Alden, J. Michael: *See—*
Schlosser, Erich J.; and Alden, J. Michael, 5,069,196, Cl. 126-25.00R.

Alexander, Richard M.; and Abbey, Woodbury, III Signal vest, colored, reflective, and lighted, worn by persons seen on and nearby roadways and highways and other needed areas. 5,070,436, Cl. 362-108.000.

Alexandrovich, Peter S.: *See—*
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Allen, Clive J.: *See—*
Street, Michael J.; Benson, John A.; Marchant, John A.; Wilkin, Arthur L.; and Allen, Clive J., 5,069,160, Cl. 119-14.080.

Allen, William C.; Pye, Stephen D.; Hamblin, Gerald M.; Perez, Jose M.; Amend, William E.; Bush, John D.; Holligan, David; and Pyle, Delbert E., to Union Oil Company of California. Brittle lined pipe connector. 5,069,485, Cl. 285-55.000.

Allevard Industries: *See—*
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—Glans, Jeffrey H.; and Akkapeddi, Murali K., 5,070,152, Cl. 525-397.000.
—Good, Stanley B., 5,069,480, Cl. 280-743.000.
—Jen, Kway-Yue A.; and Elsenbaumer, Ronald L., 5,069,820, Cl. 252-500.000.
—Largman, Theodore; Mares, Frank; and Rodman, Clarke A., 5,069,970, Cl. 428-373.000.
—Oxenrider, Bryce C.; Long, David J.; and Mares, Frank, 5,070,162, Cl. 526-216.000.
—Pona, Joseph, Jr., 5,070,289, Cl. 318-640.000.

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Wasimoto, Takasi; and Kimura, Morio, 5,069,640, Cl. 439-619.000.

Althaus, Rolf; and Zauner, Erwin, to Asea Brown Boveri Ltd. Pressure wave machine. 5,069,600, Cl. 417-64.000.

Aluminum Company of America: *See—*
Misra, Chanakya, 5,069,889, Cl. 423-306.000.

Aluminum Pechiney: *See—*
Vanvoren, Claude; Coste, Benoit; and Keime, Francois, 5,069,842, Cl. 264-101.000.

Alvarez, Edwardo; DiSano, Lorenzo P.; and Ward, Bennett C., to Hoechst Celanese Corporation. Molded polybenzimidazole/-polyaryleneketone articles and method of manufacture. 5,070,153, Cl. 525-420.000.

ALZA Corporation: *See—*
Theeuwes, Felix, 5,069,671, Cl. 604-251.000.

AM International Incorporated: *See—*
Kleinhen, Stephen R.; and Bryson, Robert A., Sr., 5,069,598, Cl. 414-790.000.

Amato, Joseph S.: *See—*
Hughes, David L.; Reider, Paul J.; Amato, Joseph S.; Bergan, James J.; and Grabowski, Edward J. J., 5,070,022, Cl. 435-280.000.

Amchim S.A.: *See—*
Vanysacker, Yves, 5,068,998, Cl. 47-58.000.

Amend, William E.: *See—*
Allen, William C.; Pye, Stephen D.; Hamblin, Gerald M.; Perez, Jose M.; Amend, William E.; Bush, John D.; Holligan, David; and Pyle, Delbert E., 5,069,485, Cl. 285-55.000.

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American Cyanamid Company: *See—*
—Murdock, Keith C.; and Lee, Ving J., 5,070,082, Cl. 514-105.000.

American Home Products Corporation: *See—*
Schiehser, Guy A.; and Von Burg, Gregory F., 5,070,207, Cl. 548-208.000.

American Institute of Taxidermy, Inc.: *See—*
Rinehart, John R., 5,068,995, Cl. 43-17.000.

American National Can Company: *See—*
Tse, Samuel W.; Schroeder, George O.; and Iwanami, Teruo, 5,069,955, Cl. 428-213.000.

Amino, Toshikazu; and Takenaka, Satoshi, to Ibiden, Co. Ltd. Starting composition for the production of silicon carbide and method of producing the same. 5,070,049, Cl. 501-88.000.

Amoco Corporation: *See—*
—Anthon, Douglas W., 5,070,507, Cl. 372-41.000.
—Dixon, George J., 5,070,505, Cl. 372-22.000.

Amorese, Franklyn J.; and Gruver, Morris E., III, to Pfaudler Companies, Inc., The. Valve for clean chemical reactor. 5,069,423, Cl. 251-144.000.

Amp-Akzo Corporation: *See—*
Leech, Edward J.; and Johnson, Steven M., 5,070,002, Cl. 430-325.000.

AMP Incorporated: *See—*
Buck, Jonathan E.; and Kaufman, John W., 5,069,627, Cl. 439-66.000.

Amthor, Thomas; Neumann, Erwin; von Rolbicki, Wolfgang; and Starke Frank, to Keiper Recaro GmbH & Co. Vehicle seat, especially an air passenger seat. 5,069,505, Cl. 297-216.000.

Amundson, W. Duane, Jr.; and Nigrin, Jaroslava M., to Corning Incorporated. Colored glass-ceramics. 5,070,043, Cl. 501-3.000.

Analog Devices, Incorporated: *See—*
Hisano, Shinichi, 5,070,331, Cl. 341-154.000.

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Castenschiold, Rene; and Andersen, John P., 5,070,252, Cl. 307-64.000.

Anderson, Bruce M.; and Broderick, Brian E., to Honeywell Inc. Digital vector generator apparatus for providing mathematically precise vectors and symmetrical patterns. 5,070,466, Cl. 395-143.000.

Anderson, Carl, to Anderson Cook, Inc. Roll forming notches in a thin-wall power transmission member. 5,069,575, Cl. 403-359.000.

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Anderson, Carl, 5,069,575, Cl. 403-359.000.

Anderson, Jack R. Panel for animal truck ventilation ports. 5,069,357, Cl. 220-307.000.

Anderson, Janet P. Soft hand and wrist splint. 5,069,203, Cl. 128-87.00R.

Anderson, Jerrel C., to Du Pont de Nemours, E. I., and Company. Process for improving adhesion of polysiloxane coatings to polymeric substrates via reduced alkali metal cation content. 5,069,942, Cl. 427-387.000.

Andersson, Matts: *See—*
Rangert, Bo; Jorneus, Lars; Holmberg, Claes; and Andersson, Matts, 5,069,622, Cl. 433-173.000.

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Herbert, William G.; Andrews, John R.; and Griffiths, Clifford H., 5,069,758, Cl. 205-73.000.

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Ansquer, Patrick: *See—*
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Anthon, Douglas W., to Amoco Corporation. Three micron laser. 5,070,507, Cl. 372-41.000.

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Aoki, Akira; Fujishima, Yukio; Makio, Yusuke; Kusakawa, Susumu; Tsuji, Sadaaki; and Okamura, Tadashi, to Osaka-Fu; and Itoh Seiyu Kabushiki Kaisha. Powder electroluminescent element comprising inorganic electroluminescent particles and a polyurethane binder. 5,069,815, Cl. 252-301.360.

Aoki, Harumi: *See—*
Miyadera, Shunichi; and Aoki, Harumi, 5,070,409, Cl. 358-241.000.

Aoki, Kunimitsu: *See—*
Iino, Tadashi; and Aoki, Kunimitsu, 5,070,323, Cl. 340-705.000.

Applied Materials, Inc.: *See—*
Lorimer, D'Arcy H.; and Bercaw, Craig A., 5,069,938, Cl. 427-255.100.

Applied Power Inc.: *See—*
Stobbs, Thomas J.; and Patel, Kishor J., 5,069,420, Cl. 251-30.020.

Aquapore Moisture Systems: *See—*
Prassas, Thomas N.; and Bard, Shannon, 5,069,388, Cl. 239-145.000.

Arai, Takao: *See—*
Watababe, Naotaka; Arai, Takao; Fujiyoshi, Hitoshi; and Shirota, Masako, 5,069,754, Cl. 162-168.200.

Arai, Takeo; Kato, Mariko; and Nagashima, Toshiharu, to Konica Corporation. Process for producing silver halide photographic materials. 5,070,005, Cl. 430-523.000.

Arai, Tetsuzo; Yamamoto, Yasushi; Raijo, Mitsuyuki; and Fujita, Isao, to Sumitomo Metal Industries, Ltd.; and Nippon Paint Co., Ltd. Actinic radiation-curable rust-preventive coating compositions for steel products. 5,069,929, Cl. 427-54.100.

Arase, Susumu: *See—*
Takasu, Hiroshi; Arase, Susumu; Yokota, Junichiro; and Nakayama, Kazuo, 5,069,855, Cl. 264-235.000.

ARCO Chemical Technology, Inc.: *See—*
Gastinger, Robert G.; and Hayes, John E., 5,070,141, Cl. 525-63.000.

Arctic Fox Heaters, Inc.: *See—*
Malecek, Edward L.; and Ramberg, Charles H., 5,069,062, Cl. 73-49.700.

Arima, Haruo: *See—*
Ohneda, Noboru; Ushioda, Shunta; Arima, Haruo; Hashimoto, Ichiro; Kaneko, Denziro; and Sugiyama, Kazuo, 5,069,055, Cl. 72-283.000.
Ohneda, Noboru; Ushioda, Shunta; Arima, Haruo; Hashimoto, Ichiro; Kaneko, Denziro; Sugiyama, Kazuo; Fukazawa, Tsuguo; Tachi, Teruo; and Mukasa, Takashi, 5,069,095, Cl. 82-124.000.

Arimoto, Akira: *See—*
Fukushima, Atsuko; Hira, Yasuo; Sato, Hidemi; Kawamoto, Kazumi; Ito, Kenchi; Shiba, Masataka; and Arimoto, Akira, 5,070,488, Cl. 360-44.120.

Aristech Chemical Corporation: *See—*
Hicks, Clark T.; Hoffman, Ray D.; and Thompson, James E., II, 5,069,851, Cl. 264-171.000.

Arndt, Maurice W. Method and apparatus for removing parasites from bees. 5,069,651, Cl. 449-2.000.

Arnott, Robin, to Husky Injection Molding Systems Ltd. Molding plastic articles. 5,069,840, Cl. 264-69.000.

Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH: *See*—
Conrad, Armin, 5,070,264, Cl. 310-68.00B.

Aruga, Tatsuo: *See*—
Matsumoto, Eiichi; and Aruga, Tatsuo, 5,069,192, Cl. 123-572.000.

Arzco Medical Electronics, Inc.: *See*—
Jadvar, Hossein; and Metzger, William T., 5,069,215, Cl. 128-642.000.

Arzneimittel GmbH Apotheker Vetter & Co.: *See*—
Vetter, Helmut; and Geprags, Peter, 5,069,670, Cl. 604-243.000.

Asahi Glass Company Ltd.: *See*—
Osada, Koichi; Nishiyama, Hisashi; and Hirano, Akira, 5,070,230, Cl. 219-203.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Yokota, Masahisa; Shimizu, Atsushi; Komiya, Kyosuke; Yamataka, Kazunori; and Nomura, Tadanori, 5,070,173, Cl. 528-85.000.

Asahi Kogaku Kogyo K.K.: *See*—
Okuyama, Takashi; and Iwama, Masatoshi, 5,070,237, Cl. 250-227.310.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See*—
Hayakawa, Masahiro; and Kosako, Kosei, 5,070,348, Cl. 354-64.000.
Miyadera, Shunichi; and Aoki, Harumi, 5,070,409, Cl. 358-241.000.

Asai, Shigenori: *See*—
Ishii, Naoki; Ina, Toshikazu; Mori, Koji; Ito, Katsunori; and Asai, Shigenori, 5,070,293, Cl. 320-2.000.

Asea Brown Boveri Ltd.: *See*—
Althaus, Rolf; and Zauner, Erwin, 5,069,600, Cl. 417-64.000.

Ashley, James R. Distribution of power from a six phase powerline to one- and three- phase loads. 5,070,441, Cl. 363-154.000.

Askew, Thomas R.; Flippen, Richard B.; and Subramanian, Munirpallam A., to Du Pont de Nemours, E. I., and Company. High temperature superconducting memory storage device and cryotron. 5,070,070, Cl. 505-1.000.

AT&T Bell Laboratories: *See*—
Dodd, Courtney V.; Morris, John R.; and Munie, Gregory C., 5,069,730, Cl. 148-23.000.
Duffany, Jeffrey L., 5,070,453, Cl. 364-402.000.

Atago, Takeshi: *See*—
Nagano, Masami; Atago, Takeshi; and Nemoto, Mamoru, 5,069,183, Cl. 123-419.000.

Ateliers de Conceptions et d'Innovations Industrielles: *See*—
Pozzo, Michel L., 5,069,877, Cl. 422-4.000.

Atlantic Richfield Company: *See*—
Croke, William M., 5,069,145, Cl. 110-244.000.
Grosboll, Martin P., 5,069,775, Cl. 208-108.000.
Katahara, Keith W., 5,069,307, Cl. 181-105.000.

Atochem: *See*—
Vuachet, Michel; and Huet, Jean-Marie, 5,069,976, Cl. 428-474.400.

Atochem North America, Inc.: *See*—
Bohen, Joseph M.; and Reilly, James L., 5,070,124, Cl. 524-151.000.

Atwal, Karnail, to E. R. Squibb & Sons, Inc. Pyranyl quinoline calcium channel blockers. 5,070,088, Cl. 514-212.000.

Auberger, Heinrich; and Muller, Heinz, to Voest-Alpine Industrieanlagenbau G.m.b.H. Plant for treating and melting metals, metal compounds and/or metal alloys or for producing calcium carbide. 5,069,429, Cl. 266-143.000.

Audi AG: *See*—
Ruf, Max; and Korostenski, Erwin, 5,069,176, Cl. 123-193.00H.

Auerbach, Andrew, to Hoechst Celanese Corporation. Impact modified polyphenylene sulfide. 5,070,127, Cl. 524-262.000.

August, Christine M.: *See*—
Holmes, Paul E.; Roberts, Katherine P.; and August, Christine M., 5,069,810, Cl. 252-174.120.

Austin, Garey, to Tennessee Valley Authority. Tent-free apparatus for particulate contamination control. 5,069,695, Cl. 55-385.100.

Automated Container Corporation: *See*—
Zysset, Edgar H., 5,069,356, Cl. 220-276.000.

Automated Storage & Retrieval Systems of America: *See*—
Farrell, Richard B.; and Rogers, James H., 5,069,513, Cl. 312-201.000.

Automatic Switch Company: *See*—
Castenschiold, Rene; and Andersen, John P., 5,070,252, Cl. 307-64.000.

Avery, Roland M., Jr., to John D. Brush & Co., Inc. Media case. 5,069,358, Cl. 220-426.000.

Avitan, Isaac, to Raymond. Traction motor controller for forklift vehicles. 5,070,283, Cl. 318-139.000.

Avitan, Shimon. Electrical supply safety socket. 5,069,632, Cl. 439-188.000.

Axelson, Eric T.; and Mathews, Thomas P., to Honeywell Inc. Two-stage release mechanism and method for self-righting a load. 5,069,136, Cl. 102-425.000.

Aycock, David F.; and Ting, Sai-Pei, to General Electric Company. Functionalized polyphenylene ethers and blends with polyamides. 5,069,818, Cl. 525-397.000.

Ayd, Jeffrey. Computer printer for printing labels and tags having vertically orientated tractor feed. 5,069,565, Cl. 400-616.000.

B. F. Goodrich Company, The: *See*—
Chasar, Dwight W., 5,070,130, Cl. 524-430.000.

B-J Trading Limited: *See*—
Hara, Akira; Sukigara, Mitsunori; and Takagi, Toshisaburo, 5,069,128, Cl. 101-425.000.

Baba, Shiro: *See*—
Takano, Makoto; Hoshi, Yasuhiko; Kurakazu, Keiichi; and Baba, Shiro, 5,070,473, Cl. 395-725.000.

Babczinsky, Peter: *See*—
Draber, Wilfried; Babczinsky, Peter; Santel, Hans-Joachim; Lurssen, Klaus; and Schmidt, Robert R., 5,069,712, Cl. 71-92.000.

Babitzka, Rudolf, to Robert Bosch GmbH. Method of manufacturing an electromagnetically actuatable valve. 5,069,834, Cl. 264-24.000.

Baccus, John B., Jr., to Southland Corporation, The. Low calorie beverage. 5,069,924, Cl. 426-590.000.

Bachel, Ernst: *See*—
Finzel, Lothar; Kreuz, Monika; and Bachel, Ernst, 5,069,523, Cl. 385-135.000.

Bachellerie, John R. Rotary fluid displacement apparatus. 5,069,606, Cl. 418-58.000.

Bacus, Michael W.; Price, Dick T.; Lewis, Dale A.; Demarchi, Michael E.; Homa, Karl L. C.; McInturff, Gary; and Gruell, Robert, to Output Technology Corporation. Roll-fusing assembly and method for thermal compensation in an electrophotographic printer. 5,070,231, Cl. 219-216.000.

Badgley, John S.: *See*—
Schmatz, Duane J.; Badgley, John S.; and McHugh, Charles O., 5,069,092, Cl. 82-1.110.

Baia, Joseph: *See*—
Patterson, Timothy P.; Hoge, Carl E.; and Baia, Joseph, 5,069,626, Cl. 439-55.000.

Bailey, Fay W., to Phillips Petroleum Company. Polyolefin composition containing fluoropolymer. 5,070,129, Cl. 524-399.000.

Bailey, Terry R.: *See*—
Tolliver, Howard R.; Bailey, Terry R.; and Bergeson, David L., 5,069,964, Cl. 428-325.000.

Bailly, Jean-Claude A.; and Bres, Philippe, to BP Chemicals Limited. Process for preparing a vanadium-based catalyst suitable for olefin polymerization. 5,070,054, Cl. 502-104.000.

Bajzek, Thomas J.: *See*—
Bridges, Jack E.; Bajzek, Thomas J.; Hofer, Kenneth E.; Spencer, Homer L.; Smith, Larry G.; and Young, Vincent R., 5,070,533, Cl. 392-301.000.

Baker, Henry A.; and Baker, Nathan L. Method for soil clod/root crop separation. 5,069,292, Cl. 171-1.000.

Baker, Nathan L.: *See*—
Baker, Henry A.; and Baker, Nathan L., 5,069,292, Cl. 171-1.000.

Baker, Richard W.; and Wijmans, Johannes G., to Membrane Technology & Research, Inc. Process for reducing emissions from industrial sterilizers. 5,069,686, Cl. 55-16.000.

Baker, Richard W.: *See*—
Kaschemekat, Jurgen; Baker, Richard W.; and Wijmans, Johannes G., 5,069,793, Cl. 210-640.000.

Bala, Harry. Bite-resistant sheath for probe. 5,069,337, Cl. 206-306.000.

Bala, Kiran: *See*—
Khanna, Jag M.; Kumar, Naresh; Bala, Kiran; and Kumar, Yatendra, 5,070,195, Cl. 540-218.000.

Baldwin, David P.; Du Toit, Stephanus F.; and Mirkin, Jose A., to General Motors Corporation. Spoiler sunroof control mechanism. 5,069,501, Cl. 296-223.000.

Ball Corporation: *See*—
Diaz, Leopoldo J., 5,070,340, Cl. 343-767.000.

Ball, James H.; and Gardner, Willis W., to Delaware Capital Formation, Inc. Method of making a low flow tilting pad thrust bearing. 5,068,965, Cl. 29-898.041.

Bambury, Ronald E.; and Seelye, David E., to Bausch & Lomb Incorporated. Novel vinyl carbonate and vinyl carbamate contact lens material monomers. 5,070,215, Cl. 556-418.000.

Barazzoni, Lia: *See*—
Masi, Francesco; Moalli, Angelo; Invernizzi, Renzo; Menconi, Francesco; Ferrero, Cesare; Malquori, Stefano; Barazzoni, Lia; and Polesello, Mario, 5,070,051, Cl. 502-9.000.

Barbieri, Giuseppe; Bordini, Deanna; and Gatti, Luciano. Disposable single-use drip-feed device with a cover for the needle after use. 5,069,341, Cl. 206-365.000.

Bard, Shannon: *See*—
Prassas, Thomas N.; and Bard, Shannon, 5,069,388, Cl. 239-145.000.

Bardo, Samuel B.: *See*—
Trainor, Robert J., Jr.; Bardo, Samuel B.; and Leonard, David A., 5,069,010, Cl. 52-127.800.

Barel, Meir. Motor vehicle accessory particularly useful for holding a sign or other article. 5,069,376, Cl. 224-277.000.

Barenz, Manfred: *See*—
Hofer, Peter; Muller, Ulrich; Barenz, Manfred; Schafer, Horst; and Muller-Lierheim, Wolfgang, 5,069,542, Cl. 351-160.00H.

Barlage, Bruno; Robert, Franz-Josef; and Gattermann, Bernd, to H. Niemeyer Sohne GmbH & Co. KG. Stub-shaft powered spinning tiller. 5,069,294, Cl. 172-49.500.

Barlage, Bruno; and Robert, Franz-Josef, to H. Niemeyer Sohne GmbH & Co. KG. Soil cultivating machine. 5,069,295, Cl. 172-123.000.

Barlet, Denis, to Rhone Poulenc Agrochimie, S.A. Fungicidal aluminum tris-alkyl-phosphonate composition. 5,070,083, Cl. 514-144.000.

Barone, Bruno J., to Scientific Design Company, Inc. Phosphorous/-vanadium oxidation catalyst. 5,070,060, Cl. 502-209.000.

Barozzi, Gian P., to AISA S.p.A. Apparatus for automatic separation along predetermined bending fracture lines in basic ceramic platelets of hybrid electronic circuits. 5,069,195, Cl. 125-23.010.

Barrett, Phillip L., to T.D.F. Partnership. Apparatus for diffusing high pressure fluid flow. 5,069,073, Cl. 73-756.000.

Barron, Mary A.: *See*—
Williams, Danny R.; and Barron, Mary A., 5,069,310, Cl. 182-187.000.

Bartels, Richard: *See*—
Schorn, Norbert; Stock, Hugo; Bartels, Richard; and Fendel, Willi, 5,069,036, Cl. 60-323.000.

Bartelt, James T.; Harris, Frank W.; and Owens, Alan R., to Staodyn, Inc. Microprocessor controlled electronic stimulating device having biphasic pulse output. 5,069,211, Cl. 128-421.000.

Bartholmey, Brett A.: *See*—
Stern, Donald J.; Heaton, Jeff S.; Tryon, James A.; and Bartholmey, Brett A., 5,069,390, Cl. 239-320.000.

Bartholomew, Donald D., to Proprietary Technology, Inc. Bleed-down connector assembly. 5,069,489, Cl. 285-319.000.

Bartkowiak, Raymond G. Harvesting conveyor. 5,069,331, Cl. 198-848.000.

Barton, Robert J.: *See*—
Lewis, Christopher; and Barton, Robert J., 5,070,335, Cl. 342-90.000.

Bartram, Philip W.; DiBona, Noel C.; Buchanan, James H.; and Rohrbaugh, Dennis K., to United States of America, Army. VX adsorption from a chlorofluorocarbon solvent using a macroreticular strong acid resin. 5,069,797, Cl. 210-690.000.

Bartroli, Javier; Anquita, Manuel; and Carceller, Elena, to J. Uriach & Cia. S.A. 2,4-disubstituted 1,3-dioxolanes. 5,070,139, Cl. 549-221.000.

BASF Akteingesellschaft: *See*—
Dersch, Rolf; Dehne, Heinrich; Gellert, Roland; Mueller, Dietrich-Wolfgang, Vinke, Johannes; and Wistuba, Eckehardt, 5,070,136, Cl. 524-555.000.

BASF Aktiengesellschaft: *See*—
Leyrer, Reinhold J.; Neumann, Peter; and Dust, Matthias, 5,069,991, Cl. 430-49.000.
Meyer, Norbert; Shirmer, Ulrich; Plath, Peter; Wuerzer, Bruno; and Westphalen, Karl-Otto, 5,069,708, Cl. 71-90.000.
Schwalm, Reinhold; Boettcher, Andreas; Fischer, Martin; and Binder, Horst, 5,069,998, Cl. 430-270.000.
Westphalen, Karl-Otto; Hamprecht, Gerhard; Wuerzer, Bruno; and Meyer, Norbert, 5,069,710, Cl. 71-92.000.

BASF Corporation: *See*—
Lind, Eric; Davis, Pauls; and Gagnon, Steven D., 5,070,140, Cl. 525-60.000.
Stanko, Wayne S., 5,070,185, Cl. 528-502.000.

BASF Magnetics GmbH: *See*—
Gerum, Johannes; Schulz, Horst; and Sauter, Jurgen, 5,069,931, Cl. 427-128.000.

Bather, Wolfgang: *See*—
Leichnitz, Kurt; May, Wolfgang; Bather, Wolfgang; and Evers, Wolfgang, 5,069,879, Cl. 422-86.000.

Batson, Jay D. Book holder. 5,069,409, Cl. 248-451.000.

Battery Technologies Inc.: *See*—
Tomantschger, Klaus; Kordesch, Karl; and Findlay, Robert D., 5,069,988, Cl. 429-59.000.

Batz, Hans-Georg: *See*—
Klein, Christian; Batz, Hans-Georg; Essig, Ulrich; and Naujoks, Kurt W., 5,070,025, Cl. 436-546.000.

Baubles, Richard C., to Jacobson Mfg. Co., Inc. Insulation displacing electrical connector. 5,069,637, Cl. 439-412.000.

Baucke, Friedrich G. K.; Braun, Jutta; and Metz, Bernd, to Schott Glaswerke. Electrochromic layer-set. 5,069,535, Cl. 359-273.000.

Baud, Philippe M.; and Bourgeois, Frederic P., to Salomon S.A. Releasable binding assembly. 5,069,463, Cl. 280-14.200.

Bauer, David M.; and Gilbert, David L., to Aeroquip Corporation. Electrical breakaway conductor. 5,069,631, Cl. 439-159.000.

Baughman, Alton. Roof rack for vehicles. 5,069,377, Cl. 224-326.000.

Bauman, Mary B.: *See*—
Williamson, Nina J.; Bingham, Dawn L.; and Bauman, Mary B., 5,069,374, Cl. 223-111.000.

Baumann, Manfred, to Metsa-Serla Oy. Paper dispenser. 5,069,378, Cl. 225-1.000.

Bausch & Lomb Incorporated: *See*—
Bambury, Ronald E.; and Seelye, David E., 5,070,215, Cl. 556-418.000.

Baxter International Inc.: *See*—
Prince, Paul R.; and Callaway, William D., 5,069,792, Cl. 210-627.000.

Bayer Aakatiengesellschaft: *See*—
Schundehutte, Karl H.; Groll, Manfred; and Stawitz, Josef W., 5,070,193, Cl. 540-125.000.

Bayer Aktiengesellschaft: *See*—
Draber, Wilfried; Babczinsky, Peter; Santel, Hans-Joachim; Lurssen, Klaus; and Schmidt, Robert R., 5,069,712, Cl. 71-92.000.
Fischer, Reiner; Jensen-Korte, Uta; Kunisch, Franz; Marhold, Albrecht; Ooms, Pieter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,069,711, Cl. 71-92.000.
Fuchs, Rainer; Wachendorff-Neumann, Ulrike; Becker, Benedikt; Erdelen, Christoph; and Stendel, Wilhelm, 5,070,098, Cl. 514-359.000.
Lockhoff, Oswald; Goossens, John; Brunner, Helmut; Sperzel, Michael; and Stunkel, Klaus G., 5,070,190, Cl. 536-22.000.
Mehlhorn, Heinz; Schmahl, Gunter; Lindner, Werner; and Haberkorn, Axel, 5,070,091, Cl. 514-242.000.
Mohrs, Klaus; Perzborn, Elisabeth; Seuter, Friedel; Fruchtmann, Romanis; and Kohlsdorfer, Christian, 5,070,096, Cl. 514-311.000.
Muller, Michael; Podszun, Wolfgang; and Winkel, Jens, 5,070,165, Cl. 526-301.000.
Wagner, Joachim; Elsner, Thomas; Rasshofer, Werner; Faehndrich, Jurgen; and Jurgens, Eberhard, 5,069,857, Cl. 264-544.000.
Welte, Rainer; and Scholl, Hans-Joachim, 5,070,115, Cl. 521-173.000.

Beacham, Lowrie M., III: *See*—
Selway, John W. T.; Beacham, Lowrie M., III; Daluge, Susan M.; Van Tuttle, Joel; and Krenitsky, Thomas A., 5,070,078, Cl. 514-50.000.

Beales, Jonathan T., to International Paper Company. Modular article carrier. 5,069,335, Cl. 206-144.000.

Bear Medical Systems, Inc.: *See*—
Casparie, James W.; and Halpern, Arieh S., 5,069,220, Cl. 128-719.000.

Beaufort, Richard; Sangroniz, James; and Cox, Darrell, to Hewlett-Packard Company. Apparatus for sequential interconnection of electrical circuit boards. 5,070,529, Cl. 361-415.000.

Beck, Merle G.; and Beck, Randall S., to Style-Mark, Inc. Pre-formed millwork article. 5,069,961, Cl. 428-316.600.

Beck, Randall S.: *See*—
Beck, Merle G.; and Beck, Randall S., 5,069,961, Cl. 428-316.600.

Becker, Benedikt: *See*—
Fuchs, Rainer; Wachendorff-Neumann, Ulrike; Becker, Benedikt; Erdelen, Christoph; and Stendel, Wilhelm, 5,070,098, Cl. 514-359.000.

Becker, Hans F.; and Rudolf, Dieter, to Seitz Enzinger Noll Maschinenbau Aktiengesellschaft. Filter apparatus. 5,069,791, Cl. 210-344.000.

Becker, Willi, to Heidelberger Druckmaschinen Ag. Electrical circuit-breaking device for protecting a clamping device of a sheet-guiding drum of a printing machine. 5,069,126, Cl. 101-230.000.

Beekenkamp, Gerald: *See*—
Kaufman, William H.; Harrison, Frederick A.; Gidman, Claude J.; and Beekenkamp, Gerald, 5,068,984, Cl. 36-117.000.

Beeler, Alfred, to Siegfried Peyer AG. Separation apparatus. 5,068,947, Cl. 19-106.00A.

Befco, Inc.: *See*—
Vandermark, Keaton D., 5,069,022, Cl. 56-6.000.

BeiBwenger, Siegfried: *See*—
Fritsche, Wolf-Eckhart; Lubbehusen, Michael; Kukla, Reiner; and BeiBwenger, Siegfried, 5,069,772, Cl. 204-298.120.

Bell, Bernard W., Jr.: *See*—
Marshall, Daniel R.; Campbell, David K.; Bell, Bernard W., Jr.; and Towner, David K., 5,070,493, Cl. 369-112.000.

Bell, Cecil J. Apparatus for locating and drilling stud plate holes. 5,068,976, Cl. 33-666.000.

Bell Communications Research, Inc.: *See*—
Patel, Jayantilal S., 5,069,813, Cl. 252-299.010.

Bell, Laurence J. Envelopes. 5,069,384, Cl. 229-69.000.

Bellagamba, Miro D., to International Sports Technology, Inc. Golf training apparatus. 5,069,456, Cl. 273-183.00E.

Bellina, Russell F., to Du Pont de Nemours, E. I., and Company. Herbicidal thiadiazolo pyrimidines. 5,069,709, Cl. 71-90.000.

Bellio, Stephen L., to Charles Stark Draper Laboratory, Inc., The. Method and apparatus for detecting skipped stitches for a lockstitch sewing machine. 5,069,151, Cl. 112-278.000.

Bellis, Edson F., to Eastman Kodak Company. Image-forming apparatus having a replaceable cartridge and a transfer member cleaning device. 5,070,370, Cl. 355-271.000.

Belmont, Pierre, to Kerplas S.N.C. Core rod for the injection blow-moulding of a bottle with an inclined neck. 5,069,614, Cl. 425-525.000.

Benaim, Carlos: *See*—
Narula, Anubhav P. S.; De Virgilio, John J.; Benaim, Carlos; Ouwerkerk, Anton V.; and Gillotin, Olivier, 5,070,073, Cl. 512-13.000.

Benchoff, Larry J. Pickup truck retractable endgate air foil. 5,069,498, Cl. 296-180.100.

Bender, Frederic G.: *See*—
Brotsky, Eugene; and Bender, Frederic G., 5,069,922, Cl. 426-332.000.

Bendix, Horst; Hochmuth, Bernd; Johannes, Dieter; Lakenmacher, Bodo; Lausch, Winfried; and Schuebel, Klaus, to VEB Agrochemie Piesteritz; and Toyo Engineering Corporation. Process for independent control of methane and rare gas contents of an ammonia-hydrogen recovery-rare gas plant complex. 5,069,891, Cl. 423-359.000.

Bense, Pierre; and Patte, Jean-Francois, to Screg Routes et. Travaux Publics. Method and device for producing a surface coating on a surface such as a road. 5,069,578, Cl. 404-75.000.

Benson, John A.: *See*—
Street, Michael J.; Benson, John A.; Marchant, John A.; Wilkin, Arthur L.; and Allen, Clive J., 5,069,160, Cl. 119-14.080.

Benson, Montford S.: *See*—
Henderson, Philip B.; Coe, Charles G.; Fowler, Donald E.; and Benson, Montford S., 5,069,690, Cl. 55-67.000.

Bentvelsen, Petrus A.: *See*—
Carson, Ian G.; and Bentvelsen, Petrus A., 5,070,056, Cl. 502-110.000.

Benwood, Bruce R.: *See*—
Mahoney, Gregory P.; and Benwood, Bruce R., 5,070,369, Cl. 355-271.000.

Bercaw, Craig A.: *See*—
Lorimer, D'Arcy H.; and Bercaw, Craig A., 5,069,938, Cl. 427-255.100.

Berg, Lloyd, to Berg, Lloyd. Separation of cyclohexane from cyclohexene by azeotropic or extractive distillation. 5,069,756, Cl. 203-51.000.

Bergan, James J.: *See*—
Hughes, David L.; Reider, Paul J.; Amato, Joseph S.; Bergan, James J.; and Grabowski, Edward J. J., 5,070,022, Cl. 435-280.000.

Bergeson, David L.: *See*—
Tolliver, Howard R.; Bailey, Terry R.; and Bergeson, David L., 5,069,964, Cl. 428-325.000.

Bergquist, Dwight H.; Lorimor, Gary D.; and Wildy, Thomas E., to Henningsen Foods, Inc. Mechanism and method for agglomerating food powders. 5,069,118, Cl. 99-453.000.

Bergwerksverband GmbH: *See*—
Romey, Ingo; and Pass, Reinhard, 5,069,795, Cl. 210-652.000.

Bernardi, Hugo E.: *See*—
Carswell, Robert; and Bernardi, Hugo E., 5,070,110, Cl. 521-51.000.

Berni, Albert J., to Shell Oil Company. Remote seismic sensing. 5,070,483, Cl. 367-14.000.

Bertola, Aldo; and Ruggieri, Roberto, to Sisas Societa Italiana Serie Acetica e Sintetica SpA. Process of recovery of maleic anhydride from reaction gaseous mixtures. 5,069,687, Cl. 55-44.000.

Bessinger, Walter L., to Knape & Vogt Manufacturing Company. Shelving mount system. 5,069,408, Cl. 248-250.000.

Best, Mark F.: *See*—
Boulos, Edward N.; Best, Mark F.; and Surowiec, Roman, 5,070,048, Cl. 501-71.000.

Bezat, Theodore P.: *See*—
Thielman, David E.; Welch, Dennis E.; and Bezat, Theodore P., 5,069,041, Cl. 62-263.000.

Bhagat, Jayant K. Miniature inductor for integrated circuits and devices. 5,070,317, Cl. 336-200.000.

Bicron Corporation: *See*—
White, John A., 5,070,249, Cl. 250-483.100.

Bielenberg, Gerhard-Wilhelm: *See*—
Traber, Jorg; and Bielenberg, Gerhard-Wilhelm, 5,070,102, Cl. 514-415.000.

Bierlein, Eric: *See*—
Shimirak, Gerald L.; Chan, Paul S.; Kay, John; Croce, Jim; Huynh, Van L.; Swinmurn, John; and Bierlein, Eric, 5,069,636, Cl. 439-412.000.

Binder, Horst: *See*—
Schwalm, Reinhold; and Binder, Horst, 5,069,997, Cl. 430-270.000.
Schwalm, Reinhold; Boettcher, Andreas; Fischer, Martin; and Binder, Horst, 5,069,998, Cl. 430-270.000.

Binder, Rudolf; Schophoff, Friedrich; and Hofmann, Klaus, to Cassella Aktiengesellschaft. Color-stable beta-modification of a monoazo dye, a process for its preparation, and its use. 5,069,682, Cl. 8-526.000.

Bingham, Dawn L.: *See*—
Williamson, Nina J.; Bingham, Dawn L.; and Bauman, Mary B., 5,069,374, Cl. 223-111.000.

Binns, Matthew M.: *See*—
Cook, Jane K. A.; Dolby, Christine A.; Mockett, Albert P. A.; Binns, Matthew M.; Frazier, Judith A.; and Box, Philip, 5,069,902, Cl. 424-89.000.

Bio Gro Systems, Incorporated: *See*—
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Bio-Rad Laboratories, Inc.: *See*—
Zhu, Ming-De; Rodriguez, Roberto; and Wehr, C. Timothy, 5,069,766, Cl. 204-180.100.

Biologics, Inc.: *See*—
Hagopian, Mark, 5,068,935, Cl. 5-451.000.

Bioresearch, Inc.: *See*—
Esemplare, Pascal E., 5,069,965, Cl. 428-330.000.

Birkestrand, Orville J. Tube end finishing machine. 5,069,094, Cl. 82-121.000.

Birmingham, John M.; and Sullivan, Jeffrey M., to Boulder Scientific Company. Stable sodium tetraphenylborate solutions. 5,069,821, Cl. 252-500.000.

Bissett, Larry A.; and Strickland, Larry D., to United States of America, Energy. Two-stage coal gasification and desulfurization apparatus. 5,069,685, Cl. 48-77.000.

Biswas, Jaydeep; Maxwell, Ian E.; and Van Der Eijk, Johan M., to Shell Oil Company. Process for the conversion of a hydrocarbonaceous feedstock. 5,069,776, Cl. 208-120.000.

Bitsakos, Constantine. Adapter for an air spray paint gun. 5,069,389, Cl. 239-289.000.

Blades, Michael W.: *See*—
Liang, Dong C.; and Blades, Michael W., 5,069,546, Cl. 356-316.000.

Blain, David A.; and Cardis, Angeline B., to Mobil Oil Corporation. Fuel and lube additives from polyether derivatives of polyamine alkenyl succinimides. 5,069,684, Cl. 44-331.000.

Blair, John, to Blair, Paul. Leakage control device. 5,069,278, Cl. 166-68.000.

Blair, Paul: *See*—
Blair, John, 5,069,278, Cl. 166-68.000.

Blake, Carl R.: *See*—
Blake, Jimmy H.; and Blake, Carl R., 5,069,573, Cl. 403-191.000.

Blake, E. Ronald: *See*—
Young, Alan M.; and Blake, E. Ronald, 5,069,074, Cl. 73-861.380.

Blake, Jimmy H.; and Blake, Carl R., to UCO, Inc. Device for releasably coupling elongate cylindrical members. 5,069,573, Cl. 403-191.000.

Blanke, Inge; Burckhardt, Hans-Georg; Gora, Frieder; Guldner, Karl-heinz; Dehoust, Jurgen; Modes, Christina; Kemmler-Sack, Sybille; and Schmidt, Joachim, to W.C. Heraeus GmbH. Oxides of the pyrochlore family and electrically resistant materials that contain them. 5,069,824, Cl. 252-518.000.

Blankenship, David J.; George, Richard A.; and Czaplewski, Steven E., to Peerless Chain Company. Traction cable. 5,068,948, Cl. 24-115.00A.

Blaumanis, Otis R.: *See*—
Samaras, George M.; Falk, Steven M.; and Blaumanis, Otis R., 5,069,214, Cl. 128-633.000.

Blaw Knox Food & Chemical Equipment Company: *See*—
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Blazek, William S., to PCC Airfoils, Inc. Method of making a turbine engine component. 5,069,265, Cl. 164-35.000.

Blech, Ilan A.: *See*—
Sinar, Alexander B.; Gerzberg, Levy; Shacham, Yosef Y.; Blech, Ilan A.; and Sirkin, Eric R., 5,070,383, Cl. 357-51.000.

Bleil, Carl E. Method and apparatus for crystal ribbon growth. 5,069,742, Cl. 156-620.700.

Blem, Allen R.: *See*—
Dekeyser, Mark A.; and Blem, Allen R., 5,070,211, Cl. 549-378.000.

Bletscher, Warren L., Jr.; Lewkowicz, Julian; and Tayefeh, Morovat, to International Business Machines Corporation. Write calibration for magnetooptic disk recorders. 5,070,495, Cl. 369-116.000.

Blikken, Wayne C.: *See*—
Blikken, Wendell A.; and Blikken, Wayne C., 5,069,693, Cl. 55-220.000.

Blikken, Wendell A.; and Blikken, Wayne C. System for area pollution control. 5,069,693, Cl. 55-220.000.

Bliss, Dan: *See*—
Grosskrueger, Duane D.; and Bliss, Dan, 5,070,219, Cl. 200-43.008.

Blitzer, Gene. Disposable article of bedding. 5,068,936, Cl. 5-487.000.

Block, Jacob; Tessier, Noel J.; and Colageo, Anthony J., to W. R. Grace & Co.-Conn. Method of making small hollow glass spheres. 5,069,702, Cl. 65-21.400.

Block, Timothy R.; Ebler, Marcia B.; Freitag, Ladd W.; Heiling, Gerald M.; Holter, Spencer C.; Karst, Dennis L.; Siljenberg, David W.; Soderstrom, Ronald L.; and Trnka, John T., to International Business Machines Corporation. Optical fiber link card. 5,069,522, Cl. 385-39.000.

Boatwright, David A.: *See*—
Yeo, Denis; and Boatwright, David A., 5,069,865, Cl. 376-451.000.

Bochtler, Franz; and Ley, Wilhelm, to Stiegler Maschinenfabrik GmbH. Apparatus for the production of shopping bags having reinforced handle holes. 5,069,659, Cl. 493-194.000.

Bodden, William L., to Delcath Systems, Inc. Cancer treatment. 5,069,662, Cl. 604-4.000.

Boehm, Manfred, to Siemens Aktiengesellschaft. Method for a numerical positioning control system. 5,070,287, Cl. 318-569.000.

Boehnlein, Albert J., to Industrial Technology Institute. Field shift moire system. 5,069,548, Cl. 356-376.000.

Boehringer Mannheim GmbH: *See*—
Klein, Christian; Batz, Hans-Georg; Essig, Ulrich; and Naujoks, Kurt W., 5,070,025, Cl. 436-546.000.

Boeing Company, The: *See*—
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Huggins, Raymond W.; and Porter, Charles R., 5,069,547, Cl. 356-374.000.
Shepherd, William R.; and Huentelman, James H., 5,069,401, Cl. 244-118.500.

Boettcher, Andreas: *See*—
Schwalm, Reinhold; Boettcher, Andreas; Fischer, Martin; and Binder, Horst, 5,069,998, Cl. 430-270.000.

Bogdanovic, Borislav, to Studiengesellschaft Kohle mbH. Process for preparing finely divided highly reactive magnesium and use thereof. 5,069,894, Cl. 423-647.000.

Bohen, Joseph M.; and Reilly, James L., to Atochem North America, Inc. Sulfide antioxidants for stabilizing crosslinked polyolefins. 5,070,124, Cl. 524-151.000.

Bold Plastics, Inc.: *See*—
Vetter, William L.; and Mortensen, Dennis L., 5,069,235, Cl. 134-113.000.

Bolden, Hank: *See*—
Massaro, Bruno A., 5,068,927, Cl. 4-480.000.

Bollinger, Dave: *See*—
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Bolte, Georg: *See*—
Hinterwaldner, Rudolf; and Bolte, Georg, 5,070,121, Cl. 524-31.000.

Bonnett, Geroge M. "Tablecloth" disposal system. 5,069,554, Cl. 383-4.000.

Booyens, Andries M. Fluid control valve and actuator therefor. 5,069,246, Cl. 137-219.000.

Bopp, Lawrence: *See*—
Parsons, Linda M.; Bopp, Lawrence; Waring, Alfred L.; and Shayegani, Mehdi, 5,070,011, Cl. 435-6.000.

Borchardt, John K.; and Lau, Hon Chung, to Shell Oil Company. Gas flood surfactants enriched in olefin disulfonate. 5,069,802, Cl. 252-8.554.

Bordini, Deanna: *See*—
Barbieri, Giuseppe; Bordini, Deanna; and Gatti, Luciano, 5,069,341, Cl. 206-365.000.

Borisch, Fred. Method of regulating the speed of warp threads as a function of weave pattern and warp tension. 5,069,257, Cl. 139-99.000.

Borm, Jutta: *See*—
Seyferth, Dietmar; Sobon, Christine A.; and Borm, Jutta, 5,070,116, Cl. 523-22.000.

Born, Eng C.: *See*—
Kwon, Oh-Kyong; Hashimoto, Masashi; Malhi, Satwinder; and Born, Eng C., 5,070,297, Cl. 324-158.00P.
Bornstein, Aharon; Wolfman, Dan; and Katz, Mordechai, to State of Israel, Atomic Energy Commission Roreq Nuclear Research Ctr., The. Attenuated total reflection spectroscopy. 5,070,243, Cl. 250-341.000.
Borodin, Vadim L.; Dronov, Valery V.; and Khadzhi, Valentin E. Process for producing single crystals of optical calcite. 5,069,744, Cl. 156-623.00R.
Boss, Richard J. Apparatus for producing a cured-in-place test sample of concrete. 5,069,417, Cl. 249-74.000.
Bossen, Douglas D.; Chen, Chin-Long; and Hsiao, Mu-Yue, to International Business Machines. Method and apparatus for providing error correction to symbol level codes. 5,070,504, Cl. 371-54.000.
Boston University, Trustees of: *See*—
Gavras, Haralambos; and Lammek, Bernard, 5,070,187, Cl. 530-315.000.
Botker, Kurt, to North American Philips Corp. Coin counting control apparatus for a vending machine. 5,070,518, Cl. 377-7.000.
Bott, Jerry A.; and Butler, Floyd W., to Ideas in Motion. Bottle debagging and feeding apparatus. 5,069,594, Cl. 414-412.000.
Bottomley, Ian E.: *See*—
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Bouchard, John G. Elliptical ram air pressurized airfoil parachute. 5,069,404, Cl. 244-145.000.
Boucher, Didier, to Et Francais. Process to increase the power of the low frequency electro acoustic transducers and corresponding transducers. 5,070,486, Cl. 367-155.000.
Boulder Scientific Company: *See*—
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Boulos, Edward N.; Best, Mark F.; and Surowiec, Roman, to Ford Motor Company. Blue glass compositions. 5,070,048, Cl. 501-71.000.
Bourgeois, Frederic P.: *See*—
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Boutier, Philippe; Petit-Collin, Jean-Marc; Plebani, Dany-Ange; Mathivat, Denis; and Machura, Christophe, to Saint-Gobain Vitrage International. Method and apparatus for shaping curved glass sheets. 5,069,704, Cl. 65-106.000.
Bouwknegt, Thys; and Dietz, Claude, to Ciba-Geigy Corporation. Process for the photochemical stabilization of dyed polyamide fibres with foamed aqueous composition of copper organic complexes. 5,069,681, Cl. 8-442.000.
Box, Philip: *See*—
Cook, Jane K. A.; Dolby, Christine A.; Mockett, Albert P. A.; Binns, Matthew M.; Frazier, Judith A.; and Box, Philip, 5,069,902, Cl. 424-89.000.
Boydman, Scott A. Patient controlled analgesia system. 5,069,668, Cl. 604-121.000.
Boyer, Jon F.: *See*—
Vanover, Joel L.; Boyer, Jon F.; Hohlbein, Douglas J.; Montalbano, Anthony P.; Montalbano, Christopher P.; and Van Remoortel, John G., 5,070,351, Cl. 354-299.000.
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Braconnier, Ed, to Gilbert Wan. Engine component organizer. 5,069,464, Cl. 280-47.350.
Bradbury, Roy; Gemmell, Peter A.; and Hann, Richard A., to Imperial Chemical Industries plc. Thermal transfer printing. 5,070,069, Cl. 503-227.000.
Braig, Adalbert; Meier, Hans-Rudolf; Leppard, David G.; Wasson, Robert C.; and Phillips, Emyr, to Ciba-Geigy Corporation. Phenolic benzothiazole derivatives and their use as corrosion inhibitors. 5,069,805, Cl. 252-47.500.
Bramsiepe, Holger; and Ocklenburg, Matthias, to Robert Schroder, Firma. Screwdriver with pivotal handle. 5,069,091, Cl. 81-177.700.
Brandt, Konrad, to Minnesota Mining and Manufacturing Company. Connector for connecting a plurality of individual at least partially insulated conductors with electrical contacts. 5,069,625, Cl. 439-404.000.
Braun, Jutta: *See*—
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Bray, Robert D., to O. S. Systems, Incorporated. Dry suit/water sport suit with reinforced seat. 5,068,920, Cl. 2-21.00R.
Bres, Philippe: *See*—
Bailly, Jean-Claude A.; and Bres, Philippe, 5,070,054, Cl. 502-104.000.
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Bridgeport Metal Goods Mfg. Co., The: *See*—
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Bridges, Jack E.; Bajzek, Thomas J.; Hofer, Kenneth E.; Spencer, Homer L.; Smith, Larry G.; and Young, Vincent R., to Uentech Corporation. Robust electrical heating systems for mineral wells. 5,070,533, Cl. 392-301.000.
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Bridgestone/Firestone, Inc.: *See*—
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Tompkins, Dale A.; and Sicka, Richard W., 5,069,850, Cl. 264-167.000.
Brigham and Women's Hospital: *See*—
Trudell, Leonard A., 5,069,661, Cl. 604-4.000.
Brigham Young University: *See*—
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Bristol-Myers Company: *See*—
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British Aerospace PLC: *See*—
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British Telecommunications public limited company: *See*—
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Britt, Karen M.: *See*—
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Broadhurst, Michael D., to ICI Americas Inc. Quinolyl and isoquinolyl insecticidal compounds. 5,070,097, Cl. 514-313.000.
Broadhurst, Michael D.; Cormartie, Thomas H.; Fisher, Karl J.; Haag, William G.; Kanne, David B.; and Leadbetter, Michael R., to ICI Americas Inc. Novel ketenimines as intermediates for insecticides. 5,070,210, Cl. 549-350.000.
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Kuzuya, Susumu; Shimizu, Seiji; Kato, Mikio; Ishikawa, Yujiro; Sakai, Takashi; and Yuki, Eiji, 5,069,557, Cl. 400-120.000.
Nagata, Osamu; and Seo, Keiji, 5,070,359, Cl. 355-27.000.
Ogawa, Masao, 5,069,150, Cl. 112-241.000.
Okumura, Takashi; Yamaguchi, Koshiro; and Ueda, Michio, 5,070,342, Cl. 346-76.0PH.
Suzuki, Makoto, 5,070,411, Cl. 358-302.000.
Brotsky, Eugene; and Bender, Frederic G. Process for treating poultry carcasses to control salmonellae growth. 5,069,922, Cl. 426-332.000.
Brotz, Gregory R. Structure and method of producing foams having hydrogen-filled cells for use in airship/balloon envelopes. 5,069,290, Cl. 169-45.000.
Brown, Keith E.; and Kirman, Lyle E., to Kinetico, Incorporated. Water treatment system. 5,069,779, Cl. 210-87.000.
Brown, Patrick M.: *See*—
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Brown, Robert C., to Iowa State University Research Foundation, Inc. Method and apparatus of measuring unburned carbon in fly ash. 5,069,551, Cl. 356-432.000.
Brown, Ronald E., to Phillips Petroleum Company. Separation of aromatics from alkanes. 5,069,757, Cl. 203-51.000.
Brown, Timothy E. X-Ray machine assembly including table cover and method. 5,070,520, Cl. 378-196.000.
Brownawell, Darrell W.; and Ladwig, Paul K., to Exxon Research & Engineering Company. Method for rejuvenating lubricating oils. 5,069,799, Cl. 210-749.000.
Brownscombe, Thomas F.; Forschner, Thomas C.; and Slaugh, Lynn H., to Shell Oil Company. Basic zinc-containing zeolite compositions. 5,070,052, Cl. 502-60.000.
Bruce, Charles A.: *See*—
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Bruce, John S., to T&N plc. Piston rings. 5,068,963, Cl. 29-888.073.
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Bruno, Anthony R., III. Shop vac having external exhaust filter. 5,069,696, Cl. 55-476.000.
Bruno, Thomas J., to Gas Research Institute. Hydrocarbon detector utilizing catalytic cracking. 5,070,024, Cl. 436-139.000.
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Bryson, Robert A., Sr.: *See*—
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Buchanan, Bobby L.: *See*—
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Buchanan, James H.: *See*—
Bartram, Philip W.; DiBona, Noel C.; Buchanan, James H.; and Rohrbaugh, Dennis K., 5,069,797, Cl. 210-690.000.
Buck, Jonathan E.; and Kaufman, John W., to AMP Incorporated. Adjustable stacking connector for electrically connecting circuit boards. 5,069,627, Cl. 439-66.000.
Buckholz, Lawrence L.; Sudol, Marion A.; and Byrne, Brian, to International Flavors & Fragrances Inc. Process for microwave browning, composition used for same and product produced thereby. 5,069,916, Cl. 426-243.000.
Buckley, Dieter; Munster, Erhard; and Schwarz, Wolfgang, to Diehl GmbH & Co. Propellant igniter. 5,069,130, Cl. 102-202.000.
Bueno C., Henry R.: *See*—
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Buerli, Richard, to Minnesota Mining and Manufacturing Company. Adaptive pulse width optical fault finder. 5,069,544, Cl. 356-73.100.
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Bullock Communications, Inc.: *See*—
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Bullock, Wayne J.; and Gordon, H. Edward, to Bullock Communications, Inc. Method and apparatus for contemporaneous delivery of data. 5,070,404, Cl. 358-142.000.
Bulluck, John W., to E. R. Carpenter Company, Inc. Polyurethane elastomer tire fill compositions and method of making same. 5,070,138, Cl. 524-871.000.
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Bunce, Kevin R.; and Sorby, Tore, to Elopak Systems A.G. Fluid control method and device. 5,069,239, Cl. 137-15.000.
Bunger, Richard E. Dual purpose platform for mobile storage buildings. 5,069,143, Cl. 108-51.100.
Burckhardt, Hans-Georg: *See*—
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Burgholte, Alwin; Schuermann, Udo; Hieronimus, Warner; and Horneborg, Horst, to Korte, Heinrich. Lamp supply circuit. 5,070,276, Cl. 315-209.00R.
Burkhardt, Mark R.: *See*—
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Burns, Alonzo M., Jr., to Milliken Research Corporation. Printer's blanket. 5,069,958, Cl. 428-246.000.
Burns, Richard. Erosion prevention device. 5,069,579, Cl. 405-25.000.
Burr-Brown Corporation: *See*—
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Burroughs Wellcome Co.: *See*—
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Burst, Hermann; Gosse, August-Wilhelm; Scadlich, Gunter; and Hotzer, Georg, to Dr. Ing. h.c.F. Porsche AG. Motor vehicle hatchback and a method for producing same. 5,069,499, Cl. 296-201.000.
Bush, Carroll H., to Sparton Corporation. Thermal switch for battery protection. 5,070,427, Cl. 361-104.000.
Bush, John D.: *See*—
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Dam G., Oscar G.; Bueno C., Henry R.; Contreras L., Gerardo A.; Gancthev V., Yura; and Guevara R., Nicolas O., 5,069,716, Cl. 75-495.000.
Cady, David J.; Hall, Kevin R.; and Lynn, Robert W., to Life Technologies, Inc. Large scale liquid media dispensing and supplementing system. 5,069,370, Cl. 222-464.000.
Calabrese, Gary S., to Fisher Scientific Company. Aqueous ferrioxalate compositions useful as calibrants. 5,070,023, Cl. 436-8.000.
Caldwell, Lawrence G. Device for changing flow paths in a pneumatic conveying system. 5,069,583, Cl. 406-182.000.
California Industrial Products, Inc.: *See*—
Olah, Benjamin, 5,069,051, Cl. 72-68.000.
Callaghan, Thomas M.; Pasta, Vallabhdas M.; Kale, Vasant D.; and Bruce, Charles A. Protective coating for reinforced concrete. 5,069,822, Cl. 252-511.000.
Callaway, William D.: *See*—
Prince, Paul R.; and Callaway, William D., 5,069,792, Cl. 210-627.000.
Calsonic Corporation: *See*—
Sano, Takenosuke; Koike, Keiichi; Sato, Hajime; Kimura, Toshihiro; and Enokido, Yutaka, 5,070,267, Cl. 310-89.000.
Calvani, Riccardo; Caponi, Renato; and Marone, Giuseppe, to Centro Studi e Laboratori Telecomunicazioni S.p.A. High-speed modulator of the polarization of an optical carrier. 5,069,520, Cl. 385-1.000.
Cambou, Bertrand, to Motorola, Inc. Semiconductor structure for high power integrated circuits. 5,070,382, Cl. 357-48.000.
Campbell, David K.: *See*—
Marshall, Daniel R.; Campbell, David K.; Bell, Bernard W., Jr.; and Towner, David K., 5,070,493, Cl. 369-112.000.
Campbell, James N. Treatment of sympathetically maintained pain. 5,070,084, Cl. 514-248.000.
Canavesi, Roberto; and Ligorati, Ferdinando, to Enichem Synthesis S.p.A. Oxychlorination catalyst, the method for its preparation. 5,070,062, Cl. 502-225.000.
Cangro, Ronald A.: *See*—
Raycher, Robert J.; and Cangro, Ronald A., 5,070,226, Cl. 219-98.000.
Cann, Kevin J.; Karol, Frederick J.; and Marcinkowsky, Arthur E., to Union Carbide Chemicals and Plastics Technology Corporation. Simplified polyethylene catalyst system. 5,070,057, Cl. 502-119.000.
Cannon-Muskegon Corporation: *See*—
Harris, Kenneth; and Erickson, Gary L., 5,069,873, Cl. 420-448.000.
Canon Denshi Kabushiki Kaisha: *See*—
Takahashi, Kazushi, 5,070,418, Cl. 360-71.000.
Canon Kabushiki Kaisha: *See*—
Echizen, Hiroshi; and Takaki, Satoshi, 5,069,928, Cl. 427-45.100.
Endo, Kiyonobu, 5,070,490, Cl. 369-44.260.
Haraguchi, Shosuke; Kawamura, Masaharu; and Morishima, Hideki, 5,070,349, Cl. 354-152.000.
Ishii, Yoshiki; Shimokoriyama, Makoto; Shimizu, Tetsuya; Yoshimura, Katsuji; Fujii, Akio; and Sasatani, Tomohiko, 5,070,402, Cl. 358-135.000.
Kinoshita, Takao, 5,070,406, Cl. 358-224.000.
Kitagishi, Nozomu, 5,069,537, Cl. 359-557.000.
Matsumoto, Hiroaki, 5,070,415, Cl. 353-482.000.
Satoh, Tamotsu; Yonehara, Takao; and Nakamura, Yoshio, 5,070,034, Cl. 437-52.000.
Shikakura, Akihiro, 5,070,503, Cl. 371-37.100.
Tanaka, Atsushi; Kaneko, Kiyoshi; Yoshimura, Yuichiro; Suzuki, Noriyuki; Kobayashi, Katsuyuki; Mori, Shigeki; and Taniishi, Shinnosuke, 5,070,325, Cl. 340-706.000.
Tsuchiya, Yoshiro, 5,070,366, Cl. 355-219.000.
Canterberry, J. B.; and Murray, Terry A., to Olin Corporation. Elastomer-containing casings for propellants. 5,069,133, Cl. 102-332.000.
Caponi, Renato: *See*—
Calvani, Riccardo; Caponi, Renato; and Marone, Giuseppe, 5,069,520, Cl. 385-1.000.
Carceller, Elena: *See*—
Bartroli, Javier; Anquita, Manuel; and Carceller, Elena, 5,070,139, Cl. 549-221.000.
Cardis, Angeline B.: *See*—
Blain, David A.; and Cardis, Angeline B., 5,069,684, Cl. 44-331.000.
Carl Manufacturing Co., Ltd.: *See*—
Mori, Chuzo, 5,069,097, Cl. 83-56.000.
Carl-Zeiss: *See*—
Herzog, Klaus; and Breyer, Karl-Hermann, 5,068,972, Cl. 33-503.000.
Carl-Zeiss-Stiftung: *See*—
Hinz, Alexander, 5,069,545, Cl. 356-28.500.
Carmichael, Kathleen M.: *See*—
Robinette, Susan; Mammino, Joseph; Carmichael, Kathleen M.; Tokoli, Emery G.; Lynch, Anita P.; and Yu, Robert C. U., 5,069,993, Cl. 430-58.000.
Carner, William E.: *See*—
Ulick, Thomas J.; and Carner, William E., 5,070,109, Cl. 521-41.000.
Carretta, Tiziano, to Ebara Corporation. Metal plate stator case, particularly for radial centrifugal pumps. 5,069,599, Cl. 415-182.100.
Carson, David M.; and Romanauskas, William A., to Du Pont de Nemours, E. I., and Company. Centrifuge motor mount having two slotted members. 5,069,413, Cl. 248-638.000.
Carson, Ian G.; and Bentvelsen, Petrus A., to Shell Internationale Research Maatschappij, B.V. Alkene polymerization process and catalyst compositions therefor. 5,070,056, Cl. 502-110.000.
Carswell, Charles W., to Dana Corporation. Method and apparatus for forming an incomplete hole in a workpiece. 5,069,093, Cl. 82-1.110.
Carswell, Robert; and Bernardi, Hugo E., to Dow Chemical Company, The. Blends of alkylene glycols and relatively high equivalent weight active hydrogen compounds containing multipurpose additives. 5,070,110, Cl. 521-51.000.
Carter, John A. Marine safety system for positive-pressure engines. 5,069,154, Cl. 114-211.000.
Carter, Richard T.: *See*—
Chandley, George D.; and Carter, Richard T., 5,069,271, Cl. 164-516.000.

Casagrande, Cesare; Norcini, Gabriele; Santangelo, Francesco; and Semeraro, Claudio, to Simes Societa Italiana Medicinali e Sintetici S.p.A. Compounds active on the cardiovascular system. 5,070,106, Cl. 514-651.000.

Case Corporation: *See—*
Horsch, Rudolf, 5,069,296, Cl. 172-825.000.

Casey, Marion B. Self-locking two-part grommet. 5,069,586, Cl. 411-339.000.

Casio Computer Co., Ltd.: *See—*
Iba, Akio; and Tsutsumi, Kenichi, 5,069,105, Cl. 84-605.000.
Ise, Satoshi, 5,069,439, Cl. 271-163.000.
Sakashita, Shigeo, 5,069,106, Cl. 84-626.000.
Sakashita, Shigeo, 5,069,107, Cl. 84-659.000.

Casparie, James W.; and Halpern, Arieh S., to Bear Medical Systems, Inc. Measurement of gas concentration in exhaled breath. 5,069,220, Cl. 128-719.000.

Cassella Aktiengesellschaft: *See—*
Binder, Rudolf; Schophoff, Friedrich; and Hofmann, Klaus, 5,069,682, Cl. 8-526.000.

Castenschiold, Rene; and Andersen, John P., to Automatic Switch Company. Automatic transfer switch. 5,070,252, Cl. 307-64.000.

Castle, Randall D. Method of pail construction. 5,069,736, Cl. 156-94.000.

Caterpillar Inc.: *See—*
Johnson, Mark L.; and Oertley, Thomas E., 5,069,509, Cl. 305-58.0PC.

Cathey, David A.; Tuttle, Mark E.; Lee, Ruojia; and Lowrey, Tyler A., to Micron Technology, Inc. Creation and removal of temporary silicon dioxide structures on an in-process integrated circuit with minimal effect on exposed, permanent silicon dioxide structures. 5,069,747, Cl. 156-643.000.

Cavada, Peter: *See—*
Obermeier, Josef; Magyari, Eugen; Ritt, Walter; Wohlwend, Ernst; Gassmann, Horst-Detlef; and Cavada, Peter, 5,069,584, Cl. 408-145.000.

Cavagna, Elio, to Elio Cavagna S.r.l. Limit switch for the selective positioning of cutting units in an apparatus for the cutting of plastic and/or paper materials. 5,069,098, Cl. 83-62.100.

Caywood, John M. Nonvolatile associative memory system. 5,070,480, Cl. 365-49.000.

Cebal: *See—*
Godard, Jacques; and Schneider, Bernard, 5,069,368, Cl. 222-321.000.

Central Glass Company, Limited: *See—*
Kobayashi, Yoshiyuki; Suehaga, Takashi; Mouri, Isamu; and Fujii, Tukasa, 5,069,724, Cl. 134-37.000.
Suenaga, Takashi; Fujii, Tukasa; and Kobayashi, Yoshiyuki, 5,069,887, Cl. 423-240.00V.
Syori, Hideichi; and Suda, Haruhisa, 5,068,977, Cl. 34-54.000.

Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Calvani, Riccardo; Caponi, Renato; and Marone, Giuseppe, 5,069,520, Cl. 385-1.000.

Centro Sviluppo Materiale SpA: *See—*
Colaiacovo, Ferdinando; Derchi, Domenico; and Memmi, Massimo, 5,069,966, Cl. 428-336.000.

Chagnot, Bruce J., to Stirling Technology, Inc. Air to air recouperator. 5,069,272, Cl. 165-8.000.

Chamblee, Wayne J.; and Greenwood, Brian F., to Kamyr, Inc. Hydrocyclone deinking of paper during recycling. 5,069,751, Cl. 162-5.000.

Chan, Paul S.: *See—*
Shimirak, Gerald L.; Chan, Paul S.; Kay, John; Croce, Jim; Huynh, Van L.; Swinmurn, John; and Bierlein, Eric, 5,069,636, Cl. 439-412.000.

Chandler, Jasper S.: *See—*
Perry, Stuart D.; and Chandler, Jasper S., 5,070,489, Cl. 369-44.160.

Chandley, George D.; and Carter, Richard T., to Hitchiner Corporation. Countergravity casting using particulate supported thin walled investment shell mold. 5,069,271, Cl. 164-516.000.

Chang, Jack. Baby crib with slidably lockable fence member. 5,068,932, Cl. 5-100.000.

Chang, Kelvin Y.: *See—*
Roensch, L. Frederick; Chang, Kelvin Y.; and Tanner, Clarence T., 5,069,286, Cl. 166-312.000.

Charles Stark Draper Laboratory, Inc., The: *See—*
Bellio, Stephen L., 5,069,151, Cl. 112-278.000.

Charlot, Lincoln H., Jr.: *See—*
Lynch, John L.; and Charlot, Lincoln H., Jr., 5,069,047, Cl. 70-57.100.

Chasar, Dwight W., to B. F. Goodrich Company, The. Alkaline earth oxides and hydroxides to reduce nitrosamine formation from vulcanization accelerators. 5,070,130, Cl. 524-430.000.

Chassaing, Paul: *See—*
Soulard, Paul; Chassaing, Paul; and Moreau, Georges, 5,070,286, Cl. 318-568.100.

Chau, Albert W., to FlowMole Corporation. Device for locating a boring machine. 5,070,462, Cl. 364-460.000.

Cheil Synthetics Inc.: *See—*
Kim, Kwang T.; Kim, Tae H.; and Kim, Young S., 5,070,179, Cl. 528-272.000.

Chen, Chien J. Namecard holder and dispenser. 5,069,333, Cl. 206-39.500.

Chen, Chin-Long: *See—*
Bossen, Douglas D.; Chen, Chin-Long; and Hsiao, Mu-Yue, 5,070,504, Cl. 371-54.000.

Chen, Dennis. Racket handle butt plate. 5,069,452, Cl. 273-73.00J.

Chen, Nathan, to Perfect Fastener, Inc. Key holder assembly with separable straps of complementary hook and loop fastening materials. 5,069,050, Cl. 70-456.00R.

Chen, Paul N., Sr.; Forschirm, Alex; Glick, Morton; and Jaffe, Michael, to Hoechst Celanese Corp. Reactive compatibilization of polyacetal and polypropylene blends. 5,070,144, Cl. 525-154.000.

Chen, Shieh-Shung T.: *See—*
Petuch, Brian R.; Chen, Shieh-Shung T.; Inamine, Edward S.; and White, Raymond F., 5,070,015, Cl. 435-42.000.

Chen, Shih-Ou: *See—*
McCollum, John L.; and Chen, Shih-Ou, 5,070,384, Cl. 357-51.000.

Chen, Xiao H.; and Oksman, Juhani. Optimization method and an optimized filter for sidelobe suppression. 5,070,337, Cl. 342-201.000.

Cheng, J. Joseph, to Libbey-Owens-Ford Co. Infrared radiation absorbing blue glass composition. 5,069,826, Cl. 252-587.000.

Cheng, Peter S. C. Washable mug with self-contained sound system. 5,070,539, Cl. 455-344.000.

Cheung, Harry; Couche, Michael R.; and Dray, James R., to Union Carbide Industrial Gases Technology Corporation. Xenon production system. 5,069,698, Cl. 62-22.000.

Chiang, George C., to Du Pont de Nemours, E. I., and Company. Process for the preparation of 2-amino-4-methyl-6-methoxy-1,3,5-triazine. 5,070,199, Cl. 544-194.000.

Chiarolanzio, Martin J. Snap lock extension cord and power tool connector. 5,069,634, Cl. 439-353.000.

Chikamasa, Hiroshi: *See—*
Chino, Naoyoshi; Shibata, Norio; and Chikamasa, Hiroshi, 5,069,934, Cl. 427-131.000.

Chin, James; Marshall, James B.; Drozdick, Michael D.; Rosa, Fred C.; and Judge, Fraderick D., to Uniroyal Chemical Company, Inc. Dry reactive processing. 5,070,197, Cl. 544-11.000.

China Steel Corporation: *See—*
Li, James C. M.; and Huang, Der-Ray, 5,069,428, Cl. 266-104.000.

Chino, Naoyoshi; Shibata, Norio; and Chikamasa, Hiroshi, to Fuji Photo Film Co., Ltd. Process for producing multi-layered magnetic recording media. 5,069,934, Cl. 427-131.000.

Chisso Corporation: *See—*
Suzuki, Toshiharu; Goto, Yasuyuki; and Kitano, Kisei, 5,069,814, Cl. 252-299.670.
Takasu, Hiroshi; Arase, Susumu; Yokota, Junichiro; and Nakayama, Kazuo, 5,069,855, Cl. 264-235.000.
Waketa, Hideharu; Suzuki, Yoshiharu; Murakoshi, Motoharu; Kakiuchi, Hideaki; Ohgushi, Masuhito; Watanabe, Kenichi; and Sawai, Toshiya, 5,069,971, Cl. 428-391.000.

Cho, Dong S., to Goldstar Electron Co., Ltd. Pulse width modulation circuit of programmable subframe system. 5,070,312, Cl. 332-109.000.

Cho, Frederick Y.; and Fliegel, Frederick M., to Motorola, Inc. Multidimensional acoustic charge transport device. 5,070,271, Cl. 310-313.00R.

Chochinov, Allan: *See—*
Moyher, George C., Jr.; Jamerson, Randy; Nessim, David; Kapec, Jeffrey; Tanaka, Kazuna; and Chochinov, Allan, 5,069,782, Cl. 210-192.000.

Chomerics, Inc.: *See—*
Thornton, Steven L., 5,070,216, Cl. 174-35.0GC.

Chong, Yong-bo: *See—*
Watanabe, Nobuatsu; Tojo, Tetsuro; Chong, Yong-bo; and Ikari, Kenji, 5,069,764, Cl. 204-60.000.

Chrobaczek, Martin; Denz, Helmut; Roth, Andreas; and Heim, Hans. Device for measuring a pulsating variable in an internal combustion engine. 5,069,063, Cl. 73-118.200.

Chu, Ruey S.; Wong, Nam S.; and Ozaki, Ernie T., to Hughes Aircraft Company. Tapered-element array antenna with plural octave bandwidth. 5,070,339, Cl. 343-700.0MS.

Chung, Ding Y.: *See—*
DeBroy, Tapan K.; and Chung, Ding Y., 5,070,149, Cl. 525-296.000.

Ciancanelli, Gino J.: *See—*
Straka, Michael J.; and Ciancanelli, Gino J., 5,069,633, Cl. 439-271.000.

Ciba-Geigy AG: *See—*
Rody, Jean; and Leppard, David G., 5,070,007, Cl. 430-551.000.

Ciba-Geigy Corporation: *See—*
Bouwknegt, Thys; and Dietz, Claude, 5,069,681, Cl. 8-442.000.
Braig, Adalbert; Meier, Hans-Rudolf; Leppard, David G.; Wasson, Robert C.; and Phillips, Emyr, 5,069,805, Cl. 252-47.500.
Robertson, J. Richard; Su, Kai C.; Goldenberg, Merrill S.; and Mueller, Karl F., 5,070,169, Cl. 528-25.000.
Robertson, J. Richard; and Su, Kai C., 5,070,170, Cl. 528-25.000.
Stockinger, Friedrich; and Kramer, Andreas, 5,070,163, Cl. 526-259.000.

Cime Bocuze: *See—*
Nicolas, Jean-Claude; and Saulnier, Raymond, 5,069,869, Cl. 419-28.000.

Citizen Watch Co., Ltd.: *See—*
Takahashi, Kotaro, 5,069,529, Cl. 359-601.000.

Clagett, Donald C.; Fox, Daniel W.; Shafer, Sheldon J.; and Sybert, Paul D., to General Electric Company. Ultraviolet radiation resistant polyphthalatecarbonate resin. 5,070,177, Cl. 528-196.000.

Clarion Co., Ltd.: *See—*
Okagaki, Hiroyuki, 5,070,472, Cl. 364-821.000.

Clark, Dereck B.: *See—*
Gilmore, John P.; and Clark, Dereck B., 5,070,458, Cl. 364-424.060.

Clark, Ronald M. Multi-purpose container opening tool. 5,069,090, Cl. 81-3.090.

Clarkin, William J., to Mobay Corporation. Device and method for applying adhesives. 5,069,881, Cl. 422-135.000.

Clay, B. Jan: *See—*
Durr, Larry L.; Clay, B. Jan; and Durr, Larry J., 5,069,755, Cl. 202-169.000.

Clelland, William F., to Ryder Truck Rental, Inc. Parcel van door. 5,069,497, Cl. 296-155.000.

Click Systems Limited: *See—*
Sykes, Christopher C., 5,069,512, Cl. 312-139.200.

Clint, Inc.: *See—*
Marc, Michel, 5,068,983, Cl. 36-44.000.

CMB Foodcan plc: *See—*
Porucznik, Paul; and Longstaff, Keith, 5,069,052, Cl. 72-84.000.

Coe, Charles G.: *See—*
Henderson, Philip B.; Coe, Charles G.; Fowler, Donald E.; and Benson, Montford S., 5,069,690, Cl. 55-67.000.

Coffey, Michael; and Hollingsworth, Richard J., to Digital Equipment Corporation. Integrated circuit having laser-alterable metallization layer. 5,070,392, Cl. 357-71.000.

Cogema: *See—*
Lagarrigue, Francis, 5,069,861, Cl. 376-260.000.

Cohen, Clark E., to General Electric Company. Doppler determination of satellite attitude. 5,070,338, Cl. 342-355.000.

Cohen, Lee S., to Dr. Cohen Group, Inc., The. Biomechanical orthotic with convertible inserts. 5,069,212, Cl. 128-615.000.

Cohen, Robert S.; Pierce, James M.; and Kinsey, William H., to Max-iMed Corporation. Intra-vaginal device and method. 5,069,906, Cl. 424-430.000.

Cohen, Ronald; and Hall, Eugene W., to International Fuel Cells Corporation. Plaque fuel cell stack. 5,069,985, Cl. 429-26.000.

Coherent, Inc.: *See—*
Johnston, Thomas F., Jr.; and Dewey, David A., 5,069,527, Cl. 359-823.000.

Cohn, Marvin: *See—*
Salib, Mike L.; and Cohn, Marvin, 5,070,304, Cl. 330-54.000.

Cointre, Jean-Pierre: *See—*
Gascuel, Yves J.; and Cointre, Jean-Pierre, 5,070,344, Cl. 346-1.100.

Colageo, Anthony J.: *See—*
Block, Jacob; Tessier, Noel J.; and Colageo, Anthony J., 5,069,702, Cl. 65-21.400.

Colaiacovo, Ferdinando; Derchi, Domenico; and Memmi, Massimo, to Centro Sviluppo Materiale SpA. Organic coating for metals. 5,069,966, Cl. 428-336.000.

Colasante, David A. Microwave reheatable clothing and toys. 5,070,223, Cl. 219-10.55M.

Cole, Donald; and Smith, Robert W., to 501 Johnson Matthey Public Limited Company. Transfer for automatic application. 5,069,954, Cl. 428-202.000.

Cole, Howard W., Jr.; and Taylor, Stephen E., to Cole, Howard W., Jr. Method for controlling dust in grain. 5,069,723, Cl. 134-25.100.

Coleman, Clarence B., to Fabricated Metals, Inc. Bulk material container with a door movable over a rectilinear path. 5,069,371, Cl. 222-509.000.

Colgate-Palmolive Company: *See—*
Joshi, David P.; Ramachandran, P.; and Soriano, Zenaida B., 5,069,825, Cl. 252-533.000.

Collins, Samuel H.: *See—*
Sprunt, Eve S.; and Collins, Samuel H., 5,069,065, Cl. 73-153.000.

Columbian Chemicals Company: *See—*
Jones, William R., Jr., 5,069,882, Cl. 422-150.000.

Colyer, Michael; and Cucinotta, Thomas. Surf board support and protector. 5,069,406, Cl. 248-156.000.

Commissaire, Henri; Pathier, Pierre; and Sirven, Jacques, to Electronique Serge Dassault. Method and device for assisting terrestrial vehicle traffic. 5,070,334, Cl. 342-43.000.

Commissariat a l'Energie Atomique: *See—*
—Machuron-Mandard, Xavier; Madic, Charles; and Koehly, Gerard, 5,069,827, Cl. 252-626.000.

Commonwealth of Australia, The: *See—*
Robinson, Paul R., 5,069,399, Cl. 244-14.000.

Commonwealth Scientific and Industrial Research Organisation, The: *See—*
Ragless, Clive L., 5,069,726, Cl. 136-201.000.
Wills, Leslie J.; and Turvey, David E., 5,070,341, Cl. 346-1.100.

CommTech International Management Corporation: *See—*
Swidler, Ronald, 5,069,995, Cl. 430-115.000.

Compagnie de Raffinage et de Distribution Total France: *See—*
Orgebin, Jean-Michel; Marty, Claude; Ansquer, Patrick; and Maroy, Pierre, 5,069,777, Cl. 208-207.000.

Compaq Computer Corporation: *See—*
Sellers, Charles A., 5,069,434, Cl. 271-2.000.

Comsat: *See—*
Lieberman, Daniel, 5,070,400, Cl. 358-84.000.

Comte, Marie J. M.; Netter, Paul L.; and Ricoult, Daniel L. G., to Corning Europe, Inc. Transparent glass-ceramic articles. 5,070,045, Cl. 501-4.000.

Confalonieri, Pierangelo; and Nicollini, Germano, to Thomson Microelectronics S. R. L. Device for converting unbalanced analog electric signals into fully differential signals. 5,070,305, Cl. 330-69.000.

Conrad, Armin, to Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH. Position sensor. 5,070,264, Cl. 310-68.00B.

Contico International, Inc.: *See—*
Dickinson, Thomas, 5,069,342, Cl. 206-372.000.

Contreras L., Gerardo A.: *See—*
Dam G., Oscar G.; Bueno C., Henry R.; Contreras L., Gerardo A.; Gancthev V., Yura; and Guevara R., Nicolas O., 5,069,716, Cl. 75-495.000.

Convac GmbH: *See—*
Kunze-Concewitz, Horst; and Zaiss, Roland, 5,069,155, Cl. 118-52.000.

Cook, Jane K. A.; Dolby, Christine A.; Mockett, Albert P. A.; Binns, Matthew M.; Frazier, Judith A.; and Box, Philip, to British Poultry Federation Research Association. Virus and vaccine therefrom for use against turkey rhinotracheitis. 5,069,902, Cl. 424-89.000.

Cook, John E., to Siemens Automotive Limited. Regulated canister purge solenoid valve having improved purging at engine idle. 5,069,188, Cl. 123-520.000.

Cooper, Graham A.; and Bottomley, Ian E., to British Aerospace PLC. Diffusion bonding and superplastic forming. 5,069,383, Cl. 228-157.000.

Cooper, Melvin; Fray, Michael J.; Richardson, Kenneth; and Steele, John, to Pfizer Inc. Alkyl 2-benzylidene-4-(benzimidazol-1-yl) benzoylacetate esters as intermediates. 5,070,205, Cl. 548-333.000.

Coran, Aubert Y.; and Davis, Leonard H., to Monsanto Company. Rubber compositions containing polymeric activators. 5,070,146, Cl. 525-192.000.

Cordis Corporation: *See—*
Shwab, Jacqueline A., 5,069,673, Cl. 604-280.000.
Sussman, Marvin L., 5,069,663, Cl. 604-9.000.

Cormartie, Thomas H.: *See—*
Broadhurst, Michael D.; Cormartie, Thomas H.; Fisher, Karl J.; Haag, William G.; Kanne, David B.; and Leadbetter, Michael R., 5,070,210, Cl. 549-350.000.

Cornelissen, Johannes M.: *See—*
Lagerwaard, Cornelis A.; Cornelissen, Johannes M.; Swarthoff, Ton; Klugkist, Jan; and Thom, David, 5,069,809, Cl. 252-174.120.

Cornerstone Products, Inc.: *See—*
Keating, Raymond E., 5,069,405, Cl. 248-98.000.

Corning Europe, Inc.: *See—*
—Comte, Marie J. M.; Netter, Paul L.; and Ricoult, Daniel L. G., 5,070,045, Cl. 501-4.000.

Corning Incorporated: *See—*
—Amundson, W. Duane, Jr.; and Nigrin, Jaroslava M., 5,070,043, Cl. 501-3.000.
—Pinckney, Linda R., 5,070,044, Cl. 501-3.000.

Cornwell, David G.: *See—*
Grodinsky, Robert M.; and Cornwell, David G., 5,070,530, Cl. 381-201.000.

Cory, Robert M., to General Dynamics Land Systems, Inc. Center connector for shoe assemblies of track laying vehicle. 5,069,510, Cl. 305-58.0PC.

Coryea, Peter F.: *See—*
Germer, Warren R.; Coryea, Peter F.; and Stillwagon, Jacob M., 5,068,962, Cl. 29-830.000.

Coste, Benoit: *See—*
Vanvoren, Claude; Coste, Benoit; and Keime, Francois, 5,069,842, Cl. 264-101.000.

Couch, John L.: *See—*
Singer, Jerome R.; Grunbaum, Francisco A.; Kohn, Philip D.; Zubelli, Jorge P.; Couch, John L.; Naparst, Harold L.; and Latham, Geoffrey, 5,070,455, Cl. 364-413.190.

Couch, Richard W., Jr.: *See—*
Luo, Lifeng; Sanders, Nicholas A.; and Couch, Richard W., Jr., 5,070,227, Cl. 219-121.550.

Couche, Michael R.: *See—*
Cheung, Harry; Couche, Michael R.; and Dray, James R., 5,069,698, Cl. 62-22.000.

Coupling Systems, Incorporated: *See—*
Halen, Richard M., Jr., 5,069,490, Cl. 285-337.000.

Courtaulds Packaging Inc.: *See—*
Holoubek, George H.; and Rhoades, John J., 5,069,856, Cl. 264-519.000.

Courtright, Glenn M.: *See—*
Dawson, John F.; Courtright, Glenn M.; and Fischer, Douglas A., 5,070,449, Cl. 395-325.000.

Cox, Darrell: *See—*
Beaufort, Richard; Sangroniz, James; and Cox, Darrell, 5,070,529, Cl. 361-415.000.

Coyle, Dennis J.: *See—*
Teutsch, Erich O.; and Coyle, Dennis J., 5,069,612, Cl. 425-133.100.

Cramer, Gregory D.; Dupre, Roger A.; and Hitchcock, George H., to Du Pont de Nemours, E. I., and Company. Sensor-holding device. 5,069,552, Cl. 356-440.000.

Crandall, Donald R., to International Business Machines Coproration. Method for testing a microprogrammed input/output interface using steal techniques. 5,070,448, Cl. 395-575.000.

CRC-Compagnia di Ricerca Chimica S.p.A.: *See—*
Miccoli, Pietro; and Decorte , Enio, 5,070,079, Cl. 514-51.000.

Creative Extruded Products, Inc.: *See—*
Wenrick, Jarod D., 5,069,940, Cl. 427-284.000.

Crepin, Michel, to Institut Pasteur. Process and reagents for the detection of a monocaternary nucleic acid, particularly a RNA in a biological material and particularly in leucocyte preparations. 5,070,009, Cl. 435-6.000.

Croce, Jim: *See—*
Shimirak, Gerald L.; Chan, Paul S.; Kay, John; Croce, Jim; Huynh, Van L.; Swinmurn, John; and Bierlein, Eric, 5,069,636, Cl. 439-412.000.

Croke, William M., to Atlantic Richfield Company. Plastic refuse disposal system. 5,069,145, Cl. 110-244.000.

Crooks, James W., Jr.: *See—*
Szlam, Aleksander; Crooks, James W., Jr.; and Warner, Charles L., II, 5,070,525, Cl. 379-196.000.

Crookston, Anthony J., Sr., to Old Reliable Wholesale, Inc. Insulated roof board. 5,069,950, Cl. 428-156.000.

Crosbie, David B. Endotracheal tube clutch. 5,069,206, Cl. 128-207.170.

Crow, William D.: *See—*
Williams, Ronald D.; and Crow, William D., 5,070,265, Cl. 310-71.000.

Crumly, William R., to Hughes Aircraft Company. Flexible electrical cable connector with double sided dots. 5,069,628, Cl. 439-67.000.

CSA, Inc.: *See—*
Snyderman, Fredric; and Russell, Robert H., 5,069,447, Cl. 272-123.000.

Cucinotta, Thomas: *See—*
Colyer, Michael; and Cucinotta, Thomas, 5,069,406, Cl. 248-156.000.

Cullen, John S.; and Incorvia, Samuel A., to Multiform Desiccants, Inc. Packet for compound treatment of gases. 5,069,694, Cl. 55-318.000.

Culross, Claude C.; Stuntz, Gordon F.; and Winter, William E., Jr., to Exxon Research and Engineering Company. FCC catalyst composition and method of making same. 5,070,053, Cl. 502-64.000.

Cuno, Incorporated: *See—*
Pulek, John L., 5,069,786, Cl. 210-232.000.

Cusack, Robert F., to GTE Valenite. Precision parallel mechanical float. 5,068,975, Cl. 33-644.000.

Cvelbar, Polona: *See—*
Kovacic, Mateja; Milovac, Jenny; Cvelbar, Polona; Stalc, Anton; Trost, Zvezdana; Kopitar, Zdravko; Kofler, Bojan; Nikolic, Vida; Lampret, Marija; and Lippai, Marija, 5,069,910, Cl. 424-464.000.

Cygnus Therapeutic Systems: *See—*
Sharma, Kuldeepak; Roy, Samir D.; and Roos, Eric J., 5,069,909, Cl. 424-449.000.

Cyprus Mines Corporation: *See—*
Nicols, Carl W.; Lorang, Michael J.; Wold, Michael O.; and Rayfield, Jerry W., 5,069,346, Cl. 209-700.000.

Czaplewski, Steven E.: *See—*
Blankenship, David J.; George, Richard A.; and Czaplewski, Steven E., 5,068,948, Cl. 24-115.00A.

Da-Tel Research Co., Inc.: *See—*
Hafer, George F.; and Rattan, Lanham P., 5,070,523, Cl. 379-94.000.

Daar, Yair: *See—*
Yahav, Shimon; and Daar, Yair, 5,070,222, Cl. 219-10.493.

Da Costa, Caio M. F. N., to Empresa Brasileira de Compressores S/A -Embraco. Rotary rolling piston type compressor. 5,069,607, Cl. 418-63.000.

Dada, Abdul G.: *See—*
Larson, Richard I.; Dada, Abdul G.; and Harmon, John L., 5,069,888, Cl. 423-260.000.

Daggs, Robert W., to General Ribbon Corporation. Ribbon cartridge mounting movable power switch tab. 5,069,563, Cl. 400-208.000.

Dahn, Jeffrey R.: *See—*
Fong, Rosamaria; Al-Janby, Harith; and Dahn, Jeffrey R., 5,069,683, Cl. 29-623.100.

Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Kawajiri, Ryoichi; Uematsu, Hiroshi; and Kato, Takahisa, 5,069,372, Cl. 222-541.000.
Nishitani, Nobuhisa, 5,070,068, Cl. 503-227.000.

Dai, Pei-Shing E.; Sherwood, David E., Jr.; and Martin, Bobby R., to Texaco Inc. Zeolite treating process. 5,069,890, Cl. 423-328.000.

Daikin Industries, Ltd.: *See—*
Ohmori, Akira; Inukai, Hiroshi; Kitahara, Takahiro; and Ueda, Akihiko, 5,069,941, Cl. 427-385.500.
Omure, Yukio; and Kitano, Kisuke, 5,070,113, Cl. 521-131.000.

Daimler-Benz AG: *See—*
Fleischer, Horst, 5,069,115, Cl. 454-166.000.

Daimler, Berthold H. Compressed gas container. 5,069,363, Cl. 222-95.000.

Dainippon Ink and Chemicals, Inc.: *See—*
Kase, Mitsuo; Kawasaki, Yoichi; and Okoshi, Noboru, 5,070,137, Cl. 524-590.000.

Daitoku, Koichi: *See—*
Kazami, Kazuyuki; Daitoku, Koichi; Ezawa, Akira; Ohtsuka, Kazuto; and Inoue, Hideya, 5,070,357, Cl. 354-468.000.

Daluge, Susan M.: *See—*
Selway, John W. T.; Beacham, Lowrie M., III; Daluge, Susan M.; Van Tuttle, Joel; and Krenitsky, Thomas A., 5,070,078, Cl. 514-50.000.

Dam G., Oscar G.; Bueno C., Henry R.; Contreras L., Gerardo A.; Gancthev V., Yura; and Guevara R., Nicolas O., to C.V.G. Siderurgica del Orinoco, C.A. Process for the production of liquid steel from iron containing metal oxides. 5,069,716, Cl. 75-495.000.

Dana Corporation: *See—*
Carswell, Charles W., 5,069,093, Cl. 82-1.110.

Danfoss A/S: *See—*
Hansen, Henning M.; and Voss, Frands W., 5,069,075, Cl. 73-861.380.

Daniel Industries, Inc.: *See—*
Kendrick, Ray; and Tatum, Gary, 5,069,252, Cl. 138-44.000.

Danieli & C. Officine Meccaniche SpA: *See—*
Duri, Antonino, 5,069,056, Cl. 72-400.000.

Danno, Yoshiaki: *See—*
Togai, Kazuhide; Danno, Yoshiaki; Yoshida, Masato; Shimada, Makoto; and Ueda, Katsunori, 5,069,181, Cl. 123-399.000.

Dansk Industri Syndikat A/S: *See—*
Larsen, Kurt H., 5,069,267, Cl. 164-155.000.

Dao-Trong, Son; Getzlaff, Klaus J.; and Helwig, Klaus, to International Business Machines Corp. High speed multiplier which divides multiplying factor into parts and adds partial end products. 5,070,471, Cl. 364-760.000.

D'Arpa, Peter: *See—*
Earnshaw, William C.; and D'Arpa, Peter, 5,070,192, Cl. 536-27.000.

Data General Corporation: *See—*
Normoyle, Kevin B.; Guyer, James M.; Vogt, Rainer; and Fong, Anthony S., 5,070,475, Cl. 395-375.000.

Dataproducts Corporation: *See—*
Lahut, Joseph; and Keeler, Jim, 5,070,345, Cl. 346-1.100.

Davies, John: *See—*
Smith, Edmund S.; and Davies, John, 5,069,221, Cl. 128-721.000.

Davis, Dennis D.: *See—*
Johnson, Richard E.; Davis, Dennis D.; Kee, David R.; Orcutt, John W.; and Hightower, Angus W., 5,070,039, Cl. 437-207.000.

Davis, Leonard H.: *See—*
Coran, Aubert Y.; and Davis, Leonard H., 5,070,146, Cl. 525-192.000.

Davis, Pauls: *See—*
Lind, Eric; Davis, Pauls; and Gagnon, Steven D., 5,070,140, Cl. 525-60.000.

Dawood, David: *See—*
Mueller, Hermann; Hendron, Timothy J.; and Dawood, David, 5,069,596, Cl. 414-607.000.

Dawson, John F.; Courtright, Glenn M.; and Fischer, Douglas A., to Honeywell Inc. Bus interface controller for computer graphics. 5,070,449, Cl. 395-325.000.

Dayco Products, Inc.: *See—*
Holden, Homer N.; Loyer, Philip K.; Noyes, Lowell T.; and Legrady, Janos J., 5,069,635, Cl. 439-400.000.

De Haan Mechatronics B.V.: *See—*
Rosenthal, Dov, 5,069,076, Cl. 74-89.150.

Deak, Ellen Y.: *See—*
Stouffer, John D.; and Deak, Ellen Y., 5,070,358, Cl. 355-20.000.

Deambrosio, Carlos. Inerted IR soldering system. 5,069,380, Cl. 228-42.000.

De Bei, Claudio. Front shock absorbing unit for motorcycles. 5,069,467, Cl. 280-276.000.

DeBroy, Tapan K.; and Chung, Ding Y., to Du Pont de Nemours, E. I., and Company. Cationic resin composition with reduced emissions during baking. 5,070,149, Cl. 525-296.000.

DEC International, Inc.: *See—*
Thompson, Paul D.; and Steingraber, Gary C., 5,069,162, Cl. 119-14.470.

Decker, Frank, to UTI Corporation. Hermetic module containing microwave component. 5,070,314, Cl. 333-260.000.

Decorte , Enio: *See—*
Miccoli, Pietro; and Decorte , Enio, 5,070,079, Cl. 514-51.000.

Def-Tec Corporation: *See—*
Pinkney, Barry D., 5,069,134, Cl. 102-368.000.

Dehart, David L., to Plexiform, Incorporated. Berry basket and cover. 5,069,344, Cl. 206-508.000.

Dehne, Heinrich: *See—*
Dersch, Rolf; Dehne, Heinrich; Gellert, Roland; Mueller, Dietrich-Wolfgang; Vinke, Johannes; and Wistuba, Eckehardt, 5,070,136, Cl. 524-555.000.

Dehoust, Jurgen: *See—*
Blanke, Inge; Burckhardt, Hans-Georg; Gora, Frieder; Guldner, Karlheinz; Dehoust, Jurgen; Modes, Christina; Kemmler-Sack, Sybille; and Schmidt, Joachim, 5,069,824, Cl. 252-518.000.

Deinhardt, Gunther: *See—*
Meusel, Otto; Burger, Josef; Deinhardt, Gunther; and Schirbl, Reinhard, 5,070,430, Cl. 361-407.000.

Dekel, Samuel: *See—*
Lidor, Cobi; Dekel, Samuel; Edelstein, Samuel; and Meyer, Michael S., 5,069,905, Cl. 424-423.000.

Dekeyser, Mark A.; and Blem, Allen R., to Uniroyal Chemical Company, Inc.; and Uniroyal Chemical Ltd./Lte. Dioxo heterocyclic compounds, composition containing same and process for plant growth regulation using same. 5,070,211, Cl. 549-378.000.

Delaware Capital Formation, Inc.: *See—*
Ball, James H.; and Gardner, Willis W., 5,068,965, Cl. 29-898.041.

Delcath Systems, Inc.: *See—*
Bodden, William L., 5,069,662, Cl. 604-4.000.

Delco Electronics Corporation: *See—*
Leisure, Ronald K.; Larsen, Oya F.; and Reger, Ronald K., 5,070,037, Cl. 437-195.000.

Dell USA Corporation: *See—*
Holman, Thomas H., Jr.; and Lunsford, David R., 5,070,450, Cl. 395-750.000.

Delvo Industries, Inc.: *See—*
Tannenbaum, Michael A., 5,069,354, Cl. 220-4.220.

Demarchi, Michael E.: *See—*
Bacus, Michael W.; Price, Dick T.; Lewis, Dale A.; Demarchi, Michael E.; Homa, Karl L. C.; McInturff, Gary; and Gruell, Robert, 5,070,231, Cl. 219-216.000.

Denis, Jean-Pierre. Projectile intended to be fired by a fire-arm. 5,069,139, Cl. 102-518.000.

Dennany, Robert, Jr.; and Randall, Ken, to ITT Corporation. Quick connector. 5,069,424, Cl. 251-149.600.

Densa Limited: *See*—
Smith, Edmund S.; and Davies, John, 5,069,221, Cl. 128-721.000.

Dent, Paul W., to Telefonaktiebolaget L M Ericsson. Logarithmic amplifier/detector delay compensation. 5,070,303, Cl. 328-145.000.

Denz, Helmut: *See*—
Chrobaczek, Martin; Denz, Helmut; Roth, Andreas; and Heim, Hans, 5,069,063, Cl. 73-118.200.

Derchi, Domenico: *See*—
Colaiacovo, Ferdinando; Derchi, Domenico; and Memmi, Massimo, 5,069,966, Cl. 428-336.000.

Dersch, Rolf; Dehne, Heinrich; Gellert, Roland; Mueller, Dietrich-Wolfgang; Vinke, Johannes; and Wistuba, Eckehardt, to BASF Akteingesellschaft. Aqueous polymer dispersions for coating wood. 5,070,136, Cl. 524-555.000.

DeSantis, Dominick A.; and Paul, Robert A., to MMII Incorporated. Zirconium silica hydrogel compositions and methods of preparation. 5,069,816, Cl. 252-315.500.

Design Opportunity Corp.: *See*—
Kole, Richard L., 5,069,669, Cl. 604-198.000.

Designer Foods, Inc.: *See*—
Gagliardi, Eugene D., Jr., 5,069,914, Cl. 426-76.000.

Desrosiers, Michael R., to United States of America, Navy. Advanced spider fixture. 5,069,096, Cl. 82-151.000.

Dethier, Louis, to Teset A.G. Grate for a fuel boiler. 5,069,146, Cl. 110-281.000.

Deutsch Metal Components: *See*—
Hyatt, Arthur J., 5,069,058, Cl. 72-413.000.

Deutschbein, Ulrich: *See*—
Reil, Wilhelm; Deutschbein, Ulrich; and Liebram, Udo, 5,069,021, Cl. 53-563.000.

Deutsche Automobilgesellschaft mbH: *See*—
Imhof, Otwin, 5,069,258, Cl. 141-1.100.

Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen: *See*—
Leister, Peter, 5,068,978, Cl. 34-57.00A.

Deutschmann, Herbert; and Sudmanns, Hans, to MTU Motoren-und Turbine-Union. Control of a charged, piston internal combustion engine having a plurality of exhaust gas turbochargers. 5,069,194, Cl. 123-612.000.

Devasthal, Prakash, to Servus Rubber Company. Rubber boot containing heat reflecting means. 5,068,982, Cl. 36-4.000.

De Virgilio, John J.: *See*—
Narula, Anubhav P. S.; De Virgilio, John J.; Benaim, Carlos; Ouwerkerk, Anton V.; and Gillotin, Olivier, 5,070,073, Cl. 512-13.000.

Devitt, Michael T.; and Weyland, Mark, to Van den Bergh Foods Co., Division of Conopco, Inc. Cocoa butter fractions. 5,069,915, Cl. 426-93.000.

DeWall, Ronald L.: *See*—
Holum, Ronald L.; Brown, Patrick M.; and DeWall, Ronald L., 5,069,044, Cl. 62-320.000.

Dewey, David A.: *See*—
Johnston, Thomas F., Jr.; and Dewey, David A., 5,069,527, Cl. 359-823.000.

De Witte, Mireille: *See*—
Watts, Arun; Muller, Louis; Verhelst, Gabriel; De Witte, Mireille; Pham, Tu; and Parfondry, Alain, 5,070,114, Cl. 521-159.000.

Dey, Thomas W., to Eastman Kodak Company. Remote optical alignment method. 5,069,528, Cl. 359-233.000.

Diafoil Company, Ltd.: *See*—
Fukuda, Yujiro; Utsumi, Shigeo; and Suzuki, Shinobu, 5,070,180, Cl. 528-272.000.

Diamond, Ivan F.; and Gordon, Adrienne S. Methods for the treatment of alcohol intoxication and dependence. 5,069,895, Cl. 424-10.000.

Diaz, Leopoldo J., to Ball Corporation. Broadband microstrip-fed antenna. 5,070,340, Cl. 343-767.000.

DiBona, Noel C.: *See*—
Bartram, Philip W.; DiBona, Noel C.; Buchanan, James H.; and Rohrbaugh, Dennis K., 5,069,797, Cl. 210-690.000.

Dickinson, Thomas, to Contico International, Inc. Combination tool box/organizer. 5,069,342, Cl. 206-372.000.

Diehl GmbH & Co.: *See*—
Buckley, Dieter; Munster, Erhard; and Schwarz, Wolfgang, 5,069,130, Cl. 102-202.000.

Diesel Kiki Co., Ltd.: *See*—
Honda, Naoko; and Nakajima, Tatsuo, 5,070,298, Cl. 324-207.200.
Nakamura, Miki; and Ohkura, Eiji, 5,069,277, Cl. 165-173.000.

Dietz, Claude: *See*—
Bouwknegt, Thys; and Dietz, Claude, 5,069,681, Cl. 8-442.000.

Dietz, Erwin; Sommer, Andreas; Kroh, Adolf; Hohn, Jurgen; Hafner, Otmar; and Rieper, Wolfgang, to Hoechst Aktiengesellschaft. Addition compounds, a process for the preparation, and their use, based on epoxy novolac-fatty amine adducts. 5,070,159, Cl. 525-504.000.

Digital Equipment Corporation: *See*—
Coffey, Michael; and Hollingsworth, Richard J., 5,070,392, Cl. 357-71.000.
Grondalski, David S., 5,070,256, Cl. 307-270.000.
Gutierrez, Jean-Marie, 5,069,749, Cl. 156-646.000.
Hawe, William R.; Tardo, Joseph J.; Kaufman, Charles W.; Gupta, Amar; Spinney, Barry A.; and Waters, Gregory M., 5,070,528, Cl. 380-48.000.
Sidman, Alan L., 5,068,959, Cl. 29-603.000.
Supnik, Robert M., 5,070,502, Cl. 371-11.100.

Dill, Michael C.: *See*—
Ernst, Richard J.; Van Allman, Don T.; Gupta, Harish C.; Dill, Michael C.; and Nilsen, Martin J., 5,069,340, Cl. 206-347.000.

Dillmann, Charles W., to General Electric Company. Rotary lock for a control rod drive. 5,069,860, Cl. 376-235.000.

Dingler, Geoffrey L.; and Jarvis, Wilbur W., to Whirlpool Corporation. Silverware basket with cutaway divider. 5,069,360, Cl. 220-501.000.

Dinnebier, Franz; and Hermanns, Hans, to FAG Kugelfischer Georg Schafer. Air-supported laying roller for textile yarn. 5,069,558, Cl. 384-115.000.

Dion, Serge. Blasting device for unblocking mine raises. 5,069,108, Cl. 86-20.150.

Dipl. -Ing. Dr. Ernst Vogelsang GmbH & Co. KG: *See*—
Vogelsang, Horst, 5,069,254, Cl. 138-111.000.

d'Iribarne, Benoit; Kuster, Hans-Werner; and Vanaschen, Luc, to Saint-Gobain Vitrage. Covering for the tempering of glass. 5,069,703, Cl. 65-104.000.

DiSano, Lorenzo P.: *See*—
Alvarez, Edwardo; DiSano, Lorenzo P.; and Ward, Bennett C., 5,070,153, Cl. 525-420.000.

DiSimone, John: *See*—
Schad, Robert D.; Akselrud, Vitaly; and DiSimone, John, 5,069,615, Cl. 425-556.000.

Disk Emulation Systems, Inc.: *See*—
Tuma, George B.; Tuma, Wade B.; and Warne, Robert E., 5,070,474, Cl. 395-500.000.

Ditka, Michael P.: *See*—
Hasan, Syed R.; Packard, Mark A.; and Ditka, Michael P., 5,069,588, Cl. 411-439.000.

Dixon, George J., to Amoco Corporation. Self-doubling micro-laser. 5,070,505, Cl. 372-22.000.

DJ S & T Limited Partnership: *See*—
Stern, Donald J.; Heaton, Jeff S.; Tryon, James A.; and Barthol-mey, Brett A., 5,069,390, Cl. 239-320.000.

Djorup, Robert S. Constant temperature anemometer. 5,069,066, Cl. 73-204.150.

DMT Marinetechnik GmbH: *See*—
Tegel, Marek, deceased; and Wenzel, Dieter, 5,069,398, Cl. 244-3.120.

Doan, Kim S.: *See*—
Nguyen, Thinh; Lazouni, Adbelkrim; and Doan, Kim S., 5,069,771, Cl. 204-292.000.

Doan, Trung T.: *See*—
Sandhu, Gurtej S.; Schultz, Laurence D.; and Doan, Trung T., 5,069,002, Cl. 51-165.00R.

Dobkin, Robert C.: *See*—
Rempfer, William C.; and Dobkin, Robert C., 5,070,259, Cl. 307-350.000.

Dobosz, Catherine R.: *See*—
Jeffway, Robert W., Jr.; and Dobosz, Catherine R., 5,069,361, Cl. 221-82.000.

Dr. Cohen Group, Inc., The: *See*—
Cohen, Lee S., 5,069,212, Cl. 128-615.000.

Dr. Ing. h.c.F. Porsche AG: *See*—
Burst, Hermann; Gosse, August-Wilhelm; Scadlich, Gunter; and Hotzer, Georg, 5,069,499, Cl. 296-201.000.

Doctor, Louis J. Automatically loading and unloading mechanism for flat removable storage elements. 5,069,597, Cl. 414-788.700.

Dodd, Courtney V.; Morris, John R.; and Munie, Gregory C., to AT&T Bell Laboratories. Water-soluble soldering paste. 5,069,730, Cl. 148-23.000.

Doherty, John A.: *See*—
Wise, James J.; and Doherty, John A., 5,069,392, Cl. 239-675.000.

Doi, Kenji: *See*—
Seike, Shoji; Mori, Koichi; Ikeda, Mitsuji; Nozaki, Masayuki; Okajima, Hisakazu; Katsukawa, Hiroyuki; Nakanishi, Kazumi; and Doi, Kenji, 5,069,525, Cl. 385-100.000.

Dokonal, Jindrich. Prelubrication apparatus. 5,069,177, Cl. 123-196.00S.

Dolan, Michael J.: *See*—
Moore, Frank D.; and Dolan, Michael J., 5,069,830, Cl. 261-94.000.

Dolby, Christine A.: *See*—
Cook, Jane K. A.; Dolby, Christine A.; Mockett, Albert P. A.; Binns, Matthew M.; Frazier, Judith A.; and Box, Philip, 5,069,902, Cl. 424-89.000.

Dombrowski, Mark: *See*—
Rhodes, Bruce R.; Bollinger, Dave; and Dombrowski, Mark, 5,070,251, Cl. 307-46.000.

Donnelly, Brian G.: *See*—
Dyer, Gerald P.; and Donnelly, Brian G., 5,069,251, Cl. 137-625.250.

Doralco, Inc.: *See*—
Trainor, Robert J., Jr.; Bardo, Samuel B.; and Leonard, David A., 5,069,010, Cl. 52-127.800.

Dorn, Gordon L., to Wadley Technologies, Inc. Stabilization of specimens for microbial analysis. 5,070,014, Cl. 435-34.000.

Dow Chemical Company, The: *See*—
Carswell, Robert; and Bernardi, Hugo E., 5,070,110, Cl. 521-51.000.
Heuvelsland, Albert J., 5,070,125, Cl. 124-155.000.
Ohba, Kaoru, 5,070,174, Cl. 528-104.000.

Dowa Mining Co., Ltd.: *See*—
Sugimura, Kentaro; Hasimoto, Shoji; and Ono, Takayuki, 5,069,803, Cl. 252-26.000.

Dowell Schlumberger Incorporated: *See*—
McKee, L. Michael; Scranton, Joseph D.; Brookey, Robert L.; Gurley, Derrel; and Sodich, Ernie, 5,069,280, Cl. 166-278.000.

Downing, Roland W.: *See*—
James, Simon M.; Downing, Roland W.; and Drouet, Dominik, 5,069,519, Cl. 385-32.000.
Doyle, Findley C., Jr.; and Alcott, William D., III, to NGS American, Inc. Computerized medical insurance system including means to automatically update member eligibility files at pre-established intervals. 5,070,452, Cl. 364-401.000.
Draber, Wilfried; Babczinsky, Peter; Santel, Hans-Joachim; Lurssen, Klaus; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Imidazolidine derivatives. 5,069,712, Cl. 71-92.000.
Draftex Industries Limited: *See*—
Hennen, Heinz J., 5,068,952, Cl. 29-235.000.
Dragerwerk Aktiengesellschaft: *See*—
Leichnitz, Kurt; May, Wolfgang; Bather, Wolfgang; and Evers, Wolfgang, 5,069,879, Cl. 422-86.000.
Dray, James R.: *See*—
Cheung, Harry; Couche, Michael R.; and Dray, James R., 5,069,698, Cl. 62-22.000.
Drent, Eit: *See*—
Wong, Pui K.; and Drent, Eit, 5,070,184, Cl. 528-491.000.
Dresser Industries, Inc.: *See*—
Levenstein, Victor M., 5,069,587, Cl. 411-432.000.
Dronov, Valery V.: *See*—
Borodin, Vadim L.; Dronov, Valery V.; and Khadzhi, Valentin E., 5,069,744, Cl. 156-623.00R.
Drouet, Dominik: *See*—
James, Simon M.; Downing, Roland W.; and Drouet, Dominik, 5,069,519. Cl. 385-32.000.
Drozdick, Michael D.: *See*—
Chin, James; Marshall, James B.; Drozdick, Michael D.; Rosa, Fred C.; and Judge, Fraderick D., 5,070,197, Cl. 544-11.000.
DT Membranfilter Vertiebs GmbH: *See*—
Mohn, Jurgen; and Heine, Wilhelm, 5,069,789, Cl. 210-321.840.
Duchateau, Eric: *See*—
Rancon, Yannick; and Duchateau, Eric, 5,069,728, Cl. 148-16.000.
Dudek, Chet: *See*—
Ishikawa, Kiichirou; Fukumoto, Yasuhiro; and Dudek, Chet, 5,069,148, Cl. 112-104.000.
Duffany, Jeffrey L., to AT&T Bell Laboratories. System and method for scheduling data transfers among a plurality of data processing units to avoid conflicting data requests. 5,070,453, Cl. 364-402.000.
Duke Manufacturing Co.: *See*—
O'Hearne, Robert L., 5,069,273, Cl. 165-12.000.
Dumas, Donald J.; and Subramanyam, Vinayakam, to Du Pont de Nemours, E. I., and Company. Process for preparing benzenesulfonate salts. 5,069,828, Cl. 260-402.000.
Dumbauld, Garry L., to Advanced Elastomer Systems, L.P. Foaming thermoplastic elastomers. 5,070,111, Cl. 521-82.000.
Dunn, Gary D. Finger-mounted toothbrush. 5,068,941, Cl. 15-167.100.
Duo-Fast Corporation: *See*—
Kerrigan, James E., 5,069,379, Cl. 227-131.000.
Dupon, Ryan W.; Thompson, Mark S.; Wiseman, Gary H.; Musolf, Douglas J.; and Tanous, Adam C., to Raychem Corporation. Metal oxide dielectric dense bodies, precursor powders therefor, and methods for preparing same. 5,070,050, Cl. 501-108.000.
Du Pont de Nemours, E. I., and Company: *See*—
Anderson, Jerrel C., 5,069,942, Cl. 427-387.000.
Askew, Thomas R.; Flippen, Richard B.; and Subramanian, Munirpallam A., 5,070,070, Cl. 505-1.000.
Bellina, Russell F., 5,069,709, Cl. 71-90.000.
Carson, David M.; and Romanauskas, William A., 5,069,413, Cl. 248-638.000.
Chiang, George C., 5,070,199, Cl. 544-194.000.
Cramer, Gregory D.; Dupre, Roger A.; and Hitchcock, George H., 5,069,552, Cl. 356-440.000.
DeBroy, Tapan K.; and Chung, Ding Y., 5,070,149, Cl. 525-296.000.
Dumas, Donald J.; and Subramanyam, Vinayakam, 5,069,828, Cl. 260-402.000.
Gentile, Wayne F.; and Kliman, Harvey L., 5,069,959, Cl. 428-294.000.
Grindstaff, Teddy H.; and Reese, Cecil E., 5,069,844, Cl. 264-103.000.
Grindstaff, Teddy H.; and Reese, Cecil E., 5,069,845, Cl. 264-103.000.
Grindstaff, Teddy H.; and Reese, Cecil E., 5,069,846, Cl. 264-103.000.
Grindstaff, Teddy H., 5,069,847, Cl. 264-103.000.
Hansen, Steven M., 5,069,843, Cl. 264-103.000.
Herkes, Frank E., 5,070,202, Cl. 544-402.000.
Hu, Yung-Haw, 5,070,046, Cl. 501-9.000.
Huang, Hsu-Nan; Hung, Ming-Hong; and Krespan, Carl G., 5,070,213, Cl. 549-448.000.
Kim, Young H., 5,070,183, Cl. 528-397.000.
Schalk, Petrus Wouter H., 5,069,638, Cl. 439-439.000.
Vanover, Joel L.; Boyer, Jon F.; Hohlbein, Douglas J.; Montalbano, Anthony P.; Montalbano, Christopher P.; and Van Remoortel, John G., 5,070,351, Cl. 354-299.000.
Zegarski, William J., 5,069,982, Cl. 428-690.000.
Dupre, Roger A.: *See*—
Cramer, Gregory D.; Dupre, Roger A.; and Hitchcock, George H., 5,069,552, Cl. 356-440.000.
Dupuy, Francois. Method and apparatus for making display boxes having windows. 5,069,658, Cl. 493-59.000.
Duraco Products, Inc.: *See*—
Hart, Richard S.; and Perdue, Thomas E., Jr., 5,068,945, Cl. 16-114.00B.
Durham, Michael D.; Stedman, Donald H.; Ebner, Timothy G.; and Burkhardt, Mark R., to ADA Technologies, Inc. Spectrometer for measuring the concentration of components in a fluid stream and method for using same. 5,070,246, Cl. 250-373.000.
Duri, Antonino, to Danieli & C. Officine Meccaniche SpA. Simplified hydraulic forging machine. 5,069,056, Cl. 72-400.000.
Durr, Larry J.: *See*—
Durr, Larry L.; Clay, B. Jan; and Durr, Larry J., 5,069,755, Cl. 202-169.000.
Durr, Larry L.; Clay, B. Jan; and Durr, Larry J. Dry cleaning solvent filtration and steam distillation recovery system. 5,069,755, Cl. 202-169.000.
Dust, Matthias: *See*—
Leyrer, Reinhold J.; Neumann, Peter; and Dust, Matthias, 5,069,991, Cl. 430-49.000.
Du Toit, Stephanus F.: *See*—
Baldwin, David P.; Du Toit, Stephanus F.; and Mirkin, Jose A., 5,069,501, Cl. 296-223.000.
Duval, Philippe, to Allevard Industries. Clip for fastening a rail of a railway comprising displacement stopping means and spring clip. 5,069,386, Cl. 238-349.000.
Dworkin, David R.; Lloyd, Robert D.; and Nguyen, Tuan, to Motorola, Inc. Selective discharge limiting seal for a battery. 5,069,986, Cl. 429-27.000.
Dworman, Nancy S.: *See*—
Dworman, Ralph M.; and Dworman, Nancy S., 5,069,645, Cl. 446-8.000.
Dworman, Ralph M.; and Dworman, Nancy S., to Ralphco, Inc. Coin bank. 5,069,645, Cl. 446-8.000.
Dyer, Gerald P.; and Donnelly, Brian G., to United Technologies Corporation. Frictionless plate valve. 5,069,251, Cl. 137-625.250.
Dyer, John J.: *See*—
Moreau, Joseph R.; and Dyer, John J., 5,069,163, Cl. 119-27.000.
Dykstra, Jonathan A.: *See*—
Suman, Michael J.; and Dykstra, Jonathan A., 5,070,434, Cl. 362-74.000.
Dynamotion Corporation: *See*—
Kosmowski, Wojciech, 5,068,958, Cl. 29-568.000.
Dynatech Electro-Optics Corporation: *See*—
Hogregfe, Robert; Knox. David J.; and Newman, George E., 5,069,003, Cl. 51-283.00R.
E. R. Carpenter Company, Inc.: *See*—
Bulluck, John W., 5,070,138, Cl. 524-871.000.
E. R. Squibb & Sons, Inc.: *See*—
Atwal, Karnail, 5,070,088, Cl. 514-212.000.
Hall, Steven E.; and Stein, Philip D., 5,070,099, Cl. 514-381.000.
Linder, Karen E., 5,069,900, Cl. 424-1.100.
E. T. Paddock Enterprises, Inc.: *See*—
Paddock, Eugene T., 5,069,007, Cl. 52-9.000.
Earnshaw, William C.; and D'Arpa, Peter, to Johns Hopkins University, The. Cloned human topoisomerase I: CDNA expression, and use for autoantibody detection. 5,070,192, Cl. 536-27.000.
Eastern Company, The: *See*—
Weinerman, Lee S.; and Vargus, Joel T., 5,069,491, Cl. 292-48.000.
Eastman Kodak Company: *See*—
Bellis, Edson F., 5,070,370, Cl. 355-271.000.
Dey, Thomas W., 5,069,528, Cl. 359-233.000.
Erhardt, Herbert J.; Nelson, Edward T.; and Stevens, Eric G., 5,070,380, Cl. 357-24.000.
Glocker, David A., 5,069,770, Cl. 204-192.120.
Harvey, Donald M., 5,070,350, Cl. 354-195.100.
Hatwar, Tukaram K.; Palumbo, Anthony C., Jr.; and Stinson, Douglas G., 5,069,984, Cl. 428-694.000.
Lubberts, Cor, 5,069,436, Cl. 271-3.100.
Mahoney, Gregory P.; and Benwood, Bruce R., 5,070,369, Cl. 355-271.000.
Marcus, Michael A.; and Graff, Ernest A., 5,070,302, Cl. 324-662.000.
Meyers, Mark M., 5,070,509, Cl. 372-45.000.
Mir, Jose M.; Agostinelli, John A.; Peterson, David L.; Paz-Pujalt, Gustavo R.; Higberg, Brian J.; and Rajeswaran, Gopalan, 5,070,072, Cl. 505-1.000.
Perry, Stuart D.; and Chandler, Jasper S., 5,070,489, Cl. 369-44.160.
Randall, Kent A., 5,070,371, Cl. 355-272.000.
Randall, Kent A., 5,070,372, Cl. 355-272.000.
Strand, Marc A., 5,070,176, Cl. 528-194.000.
Sullivan, James R.; Miller, Rodney L.; and Wetzel, Thomas J., 5,070,413, Cl. 358-456.000.
Urban, Carl T.; and Gahan, James B., 5,069,438, Cl. 271-10.000.
Vanderbilt, Jeffrey J.; and Neeley, Charles M., 5,070,122, Cl. 524-47.000.
Wilson, John C.; and Alexandrovich, Peter S., 5,070,203, Cl. 546-13.000.
Eaton Corporation: *See*—
Vandervoort, John R., 5,069,079, Cl. 74-339.000.
Ebara Corporation: *See*—
Carretta, Tiziano, 5,069,599, Cl. 415-182.100.
Ebinger, Georg: *See*—
Zillgitt, Ulrich; Speer, Harald; Haug, Kurt; Ebinger, Georg; Millers, Miervaldis; and Hasselmann, Heinrich, 5,070,433, Cl. 362-66.000.

Ebler, Marcia B.: *See*—
Block, Timothy R.; Ebler, Marcia B.; Freitag, Ladd W.; Heiling, Gerald M.; Holter, Spencer C.; Karst, Dennis L.; Siljenberg, David W.; Soderstrom, Ronald L.; and Trnka, John T., 5,069,522, Cl. 385-39.000.
Ebner, Timothy G.: *See*—
Durham, Michael D.; Stedman, Donald H.; Ebner, Timothy G.; and Burkhardt, Mark R., 5,070,246, Cl. 250-373.000.
Echizen, Hiroshi; and Takaki, Satoshi, to Canon Kabushiki Kaisha. Microwave chemical vapor deposition apparatus and feedback control method. 5,069,928, Cl. 427-45.100.
Eckberg, Richard P., to General Electric Company. Radiation-self-sensitized silicone polymers. 5,070,118, Cl. 522-99.000.
Eckert, Rudolf J.: *See*—
Rhodes, Robert B.; Eckert, Rudolf J.; and Loeffler, Donald E., 5,070,131, Cl. 524-484.000.
Economy Forms Corporation: *See*—
Jennings, Albert L., 5,069,418, Cl. 249-210.000.
Edelstein, Samuel: *See*—
Lidor, Cobi; Dekel, Samuel; Edelstein, Samuel; and Meyer, Michael S., 5,069,905, Cl. 424-423.000.
Edwards, Chester N.: *See*—
Mattson, Brian J.; and Edwards, Chester N., 5,069,113, Cl. 454-252.000.
Edwards, Larry, to Hon Industries, Inc. Panel interlock system. 5,069,263, Cl. 160-135.000.
Egan, Eugene P. Magnetized bath mat. 5,069,951, Cl. 428-172.000.
Eguchi, Takeo, to Sony Corporation. Erasing previously recorded signal in apparatus for pulse train recording of digital signal. 5,070,416, Cl. 360-66.000.
Eguchi, Yoshio: *See*—
Nakano, Shinji; Ohsugi, Hiroharu; Nakae, Yasuhiko; Tanabe, Hisaki; Takagawa, Ryozo; Eguchi, Yoshio; Tsutsui, Koichi; and Endo, Takeshi, 5,070,161, Cl. 526-193.000.
Ehrenkranz, Joel R. L. Integrity preserving and determining urine sample collection apparatus. 5,069,878, Cl. 422-61.000.
Eichen, Elliot: *See*—
Rideout, William C.; Holmstrom, Roger P.; Eichen, Elliot; Powazinik, William; LaCourse, Joanne; Schlafer, John; and Lauer, Robert B., 5,069,561, Cl. 385-14.000.
Einhorn, Robert K.; and Szoke, Istvan, to Einhorn, Robert K.; Szoke, Istvan; and Schwartz, Ansel M. Warning apparatus for a tracheotomy tube. 5,070,321, Cl. 340-608.000.
Ejima, Satoshi; and Suzuki, Masahiro, to Nikon Corporation. Electronic still camera with multi-area light metering and gray scale modification. 5,070,405, Cl. 358-209.000.
Ekbom, Lars. Armor-piercing projectile with spiculating core. 5,069,138, Cl. 102-518.000.
Ekbom, Ragnar, to ABB Stal AB. Method for manufacturing a compound pipe. 5,069,866, Cl. 419-6.000.
Elan Corporation, PLC: *See*—
Masterson, Joseph G., 5,069,904, Cl. 424-401.000.
Electrolux Water Systems, Inc.: *See*—
Moyher, George C., Jr.; Jamerson, Randy; Nessim, David; Kapec, Jeffrey; Tanaka, Kazuna; and Chochinov, Allan, 5,069,782, Cl. 210-192.000.
Electronique Serge Dassault: *See*—
Commissaire, Henri; Pathier, Pierre; and Sirven, Jacques, 5,070,334, Cl. 342-43.000.
Eli Lilly and Company: *See*—
Ingolia, Thomas D.; Kovacevic, Steven; Miller, James R.; and Skatrud, Paul L., 5,070,020, Cl. 435-183.000.
Elio Cavagna S.r.l.: *See*—
Cavagna, Elio, 5,069,098, Cl. 83-62.100.
Elison, Hans-Dieter: *See*—
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Elkem Technology a/s: *See*—
Hovland, Heljar; Nilsen, Jan; and Strom, Yngve, 5,069,005, Cl. 51-322.000.
Ellen, Peter E., to Elspan International Ltd. Building panel. 5,069,008, Cl. 52-80.000.
Ellingson, Dale. Signalling mechanism. 5,070,327, Cl. 340-815.140.
Elopak Systems A.G.: *See*—
Bunce, Kevin R.; and Sorby, Tore, 5,069,239, Cl. 137-15.000.
Elsenbaumer, Ronald L.: *See*—
Jen, Kway-Yue A.; and Elsenbaumer, Ronald L., 5,069,820, Cl. 252-500.000.
Elsner, Thomas: *See*—
Wagner, Joachim; Elsner, Thomas; Rasshofer, Werner; Faehndrich, Jurgen; and Jurgens, Eberhard, 5,069,857, Cl. 264-544.000.
Elspan International Ltd.: *See*—
Ellen, Peter E., 5,069,008, Cl. 52-80.000.
Emerson Electric Co.: *See*—
Shawcross, James P., 5,069,601, Cl. 417-360.000.
Swiderski, Paul R.; and Seadler, Paul J., 5,069,309, Cl. 182-119.000.
Williams, Ronald D.; and Crow, William D., 5,070,265, Cl. 310-71.000.
Emori, Yasuyoshi; and Ninamibata, Yukimitsu, to Jidosha Kiki Co., Ltd. Rotary valve for power steering apparatus. 5,069,250, Cl. 137-625.230.
Emoto, Masami; Nishimiya, Masanobu; and Okamoto, Akihiko, to Ricoh Company, Ltd. Optical pickup device with dual-mode drive mechanism. 5,070,494, Cl. 369-112.000.
Empresa Brasileira de Compressores S/A -Embraco: *See*—
Da Costa, Caio M. F. N., 5,069,607, Cl. 418-63.000.
Endo, Kiyonobu, to Canon Kabushiki Kaisha. Optical recording medium with tracking tracks extending beyond the recording layer and a method for detecting tracking signal from said medium. 5,070,490, Cl. 369-44.260.
Endo, Takeshi: *See*—
Nakano, Shinji; Ohsugi, Hiroharu; Nakae, Yasuhiko; Tanabe, Hisaki; Takagawa, Ryozo; Eguchi, Yoshio; Tsutsui, Koichi; and Endo, Takeshi, 5,070,161, Cl. 526-193.000.
ENEA Comitato Nazionale per la Ricerca e per lo Sviluppo. dell-'Energia Nucleare e Delle Energie Alternative: *See*—
Letardi, Tommaso, 5,070,513, Cl. 372-83.000.
Meloni, Stefano; and Rossi, Carlo, 5,068,937, Cl. 8-158.000.
Engdahl, Goran; and Wikstrom, Dag, to ABB Atom AB. Device for transmission of the movement and force of a high-magnetostrictive body. 5,070,316, Cl. 335-215.000.
Enichem Anic S.p.A.: *See*—
Masi, Francesco; Moalli, Angelo; Invernizzi, Renzo; Menconi, Francesco; Ferrero, Cesare; Malquori, Stefano; Barazzoni, Lia; and Polesello, Mario, 5,070,051, Cl. 502-9.000.
Enichem Synthesis S.p.A.: *See*—
Canavesi, Roberto; and Ligorati, Ferdinando, 5,070,062, Cl. 502-225.000.
Eniricerche, S.p.A.: *See*—
Liu, Ming-de; Bresci, Bruno; Magagnini, Pier L.; Maurizi, Nicoletta; Pedretti, Ugo; and Roggero, Arnaldo, 5,070,155, Cl. 525-432.000.
Ennco Display Systems, Inc.: *See*—
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Ennis, Jan S., to Ennco Display Systems, Inc. Display fixture for spectacles. 5,069,416, Cl. 248-902.000.
Enokido, Yutaka: *See*—
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Environmental Water Technology, Inc.: *See*—
Miller, Steven L.; Wathen, Ronald L.; and Palazzo, Raymond E., Jr., 5,069,785, Cl. 210-232.000.
Epperly, William R.; and Sprague, Barry N., to Fuel Tech, Inc. Method and composition for the reduction of ammonia emissions from non-acidic residue. 5,069,720, Cl. 106-287.350.
Epsztein, Bernard, to Thomson Tubes Electroniques. An electron source of the field emission type. 5,070,282, Cl. 315-383.000.
Erdei, Roland, to TMC Corporation. Ski brake. 5,069,473, Cl. 280-605.000.
Erdelen, Christoph: *See*—
Fuchs, Rainer; Wachendorff-Neumann, Ulrike; Becker, Benedikt; Erdelen, Christoph; and Stendel, Wilhelm, 5,070,098, Cl. 514-359.000.
Erhard, Werner, to Prufrex-Elektro-Apparatebau Inh. Helga Muller geb. Dutschke. Ignition process, arangement and apparatus for internal combustion engines with a magneto. 5,069,193, Cl. 123-602.000.
Erhardt, Herbert J.; Nelson, Edward T.; and Stevens, Eric G., to Eastman Kodak Company. Transfer gate for photodiode to CCD image sensor. 5,070,380, Cl. 357-24.000.
Erickson, Gary L.: *See*—
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Erico Fastening Systems, Inc.: *See*—
Raycher, Robert J.; and Cangro, Ronald A., 5,070,226, Cl. 219-98.000.
Erika Kochler: *See*—
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Ernst, Richard J.; Van Allman, Don T.; Gupta, Harish C.; Dill, Michael C.; and Nilsen, Martin J., to Illinois Tool Works Inc. Strip of collated fasteners for fastener-driving tool. 5,069,340, Cl. 206-347.000.
ESCO Corporation: *See*—
Fuller, William E., 5,069,871, Cl. 420-72.000.
Jones, Larren F., 5,068,986, Cl. 37-142.00A.
Esemplare, Pascal E., to Bioresearch, Inc. Articles having improved slip coatings. 5,069,965, Cl. 428-330.000.
Espenan, Jean-Michel, to Lyonnaise des Eaux. Housing for fiber-bundle filter modules. 5,069,353, Cl. 220-4.010.
Essig, Ulrich: *See*—
Klein, Christian; Batz, Hans-Georg; Essig, Ulrich; and Naujoks, Kurt W., 5,070,025, Cl. 436-546.000.
Estkowski, Christopher G.: *See*—
Estkowski, Michael H.; Estkowski, Christopher G.; and Gaishin, Michael, 5,068,943, Cl. 16-18.00A.
Estkowski, Michael H.; Estkowski, Christopher G.; and Gaishin, Michael, to Shepherd Products U.S., Inc. Dual wheel tilted axle caster with an integral retainer and bearing assembly. 5,068,943, Cl. 16-18.00A.
Et Francais: *See*—
Boucher, Didier, 5,070,486, Cl. 367-155.000.
Ethicon, Inc.: *See*—
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Ets. A. Bertaud: *See*—
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Euro Iseki Limited: *See*—
Foreman, Brain E., 5,069,243, Cl. 137-205.000.
Evans, Joseph T., Jr.; and Bullington, Jeff A., to Radiant Technologies. Ferroelectric non-volatile variable resistive element. 5,070,385, Cl. 357-51.000.
Evasick, Edward J.: *See*—
Evasick, Robert J., 5,069,185, Cl. 123-435.000.
Evasick, Robert J., to Evasick, Edward J. Diesel tune-up method. 5,069,185, Cl. 123-435.000.

Evers, Wolfgang: *See*—
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Exac Corporation: *See*—
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Exxon Research & Engineering: *See*—
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Exxon Research & Engineering Company: *See*—
Brownawell, Darrell W.; and Ladwig, Paul K., 5,069,799, Cl. 210-749.000.
Culross, Claude C.; Stuntz, Gordon F.; and Winter, William E., Jr., 5,070,053, Cl. 502-64.000.
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Fabricated Metals, Inc.: *See*—
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Fabricius, Karl. Aseptic filling machine for food. 5,069,017, Cl. 53-426.000.

Faehndrich, Jurgen: *See*—
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FAG Kugelfischer Georg Schafer: *See*—
Dinnebier, Franz; and Hermanns, Hans, 5,069,558, Cl. 384-115.000.
Niedermeier, Rudolf; and Schottdorf, Johannes, 5,069,560, Cl. 384-486.000.

Fahim, Mostafa S. Method of inhibiting generation, maturation, motility and viability of sperm with minerals in bioavailable form. 5,070,080, Cl. 514-53.000.

Fairbanks, Everitt E. Transmission mechanism. 5,069,078, Cl. 74-216.300.

Falk, Curt, to Metalform Safeset AB. Torque-limiting coupling device. 5,069,320, Cl. 192-56.00R.

Falk, Steven M.: *See*—
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Fang, Yao-chien. Basketball training assembly with multiple hoops. 5,069,441, Cl. 273-1.50A.

Fantus, I. George: *See*—
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Fanuc Ltd.: *See*—
Ikeda, Yoshiaki; Kuwasawa, Mitsuru; and Ito, Kenichi, 5,070,288, Cl. 318-618.000.
Nakamura, Kosei; and Numai, Kazuhisa, 5,070,291, Cl. 318-771.000.
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Fanuc Ltd: *See*—
Inaba, Yoshiharu; and Kamiguchi, Masao, 5,069,613, Cl. 425-150.000.

Farber, Jurgen, to PKL Verpackungssystems GmbH. Cuboid gable package with a pouring spout arranged in the area of a flat top. 5,069,385, Cl. 229-137.000.

Farrell, Richard B.; and Rogers, James H., to Automated Storage & Retrieval Systems of America. Mobile shelving safety floor. 5,069,513, Cl. 312-201.000.

Farwell, William D., to Hughes Aircraft Company. Circuitry for controlled rate of power application to CMOS microcircuits. 5,070,257, Cl. 307-296.300.

Faul, Jerome F.; and Nguyen, Julien T., to Radius Inc. Method for encoding color images. 5,070,532, Cl. 382-56.000.

Fearnot, Neal E.; and Sisken, Richard B., to Medical Engineering and Development Institute, Inc. Flexible, kink-resistant catheter. 5,069,674, Cl. 604-282.000.

Feigelson, Robert S.: *See*—
Geballe, Theodore H.; Feigelson, Robert S.; and Gazit, Dan, 5,070,071, Cl. 505-1.000.

Feldmann, Rainer; and Hess, Gunter, to Huls AG. Pulverulent polyamide mixture coating composition wherein the polyamide has as an average at least nine carbon atoms per carbonamide group. 5,070,156, Cl. 525-432.000.

Felling, Gerald J. Chaise lounge with motor-driven adjustable canopy. 5,069,504, Cl. 297-184.000.

Felson, Raymond M. Turning vane setting tool. 5,068,957, Cl. 29-566.000.

Fendel, Willi: *See*—
Schorn, Norbert; Stock, Hugo; Bartels, Richard; and Fendel, Willi, 5,069,036, Cl. 60-323.000.

Fennell, Thomas W.: *See*—
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Ferco International Usine de Ferrures de Batiment: *See*—
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Ferguson, John R.: *See*—
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Ferrero, Cesare: *See*—
Masi, Francesco; Moalli, Angelo; Invernizzi, Renzo; Menconi, Francesco; Ferrero, Cesare; Malquori, Stefano; Barazzoni, Lia; and Polesello, Mario, 5,070,051, Cl. 502-9.000.

Ferro Corporation: *See*—
Gardner, Robert D.; Hopp, Dineen M.; Shaikh, Aziz S.; and Roberts, Gordon J., 5,070,047, Cl. 501-16.000.

Ferro Tools Inc.: *See*—
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FEV Motorentechnik GmbH KG: *See*—
Schmitz, Gunter, 5,069,070, Cl. 73-597.000.

Fichtel & Sachs AG: *See*—
Schievelbusch, Ulrich, 5,069,655, Cl. 475-186.000.

Fiering, Steven: *See*—
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Figaro Engineering, Inc.: *See*—
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Figgie International, Inc.: *See*—
Urso, Tina, 5,069,205, Cl. 128-201.240.

Filippone, Mauro; and Lessi, Carlo, to Solvay & Cie (Societe Anonyme). Process for the purification of an aqueous alkali metal chloride solution from ammonium and iodine compounds. 5,069,884, Cl. 423-181.000.

Filztuchverwaltungs GmbH: *See*—
Metzinger, Friedrich, 5,068,960, Cl. 29-779.000.

Findlay, Robert D.: *See*—
Tomantschger, Klaus; Kordesch, Karl; and Findlay, Robert D., 5,069,988, Cl. 429-59.000.

Fink, Cameron L.; and Gentile, Anthony J., to Sterling Marking Products Inc. Case. 5,069,567, Cl. 402-3.000.

Finzel, Lothar; Kreuz, Monika; and Bachel, Ernst, to Siemens Aktiengesellschaft. Cassette for spare lengths of light waveguides to be used at the site to be spliced. 5,069,523, Cl. 385-135.000.

Fischer, Douglas A.: *See*—
Dawson, John F.; Courtright, Glenn M.; and Fischer, Douglas A., 5,070,449, Cl. 395-325.000.

Fischer, Joachim; and Muonning, Andreas, to Philipp Holzmann Aktiengesellschaft. Method and apparatus for cleaning layers of earth. 5,069,725, Cl. 134-42.000.

Fischer, Martin: *See*—
Schwalm, Reinhold; Boettcher, Andreas; Fischer, Martin; and Binder, Horst, 5,069,998, Cl. 430-270.000.

Fischer, Reiner; Jensen-Korte, Uta; Kunisch, Franz; Marhold, Albrecht; Ooms, Pieter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, to Bayer Aktiengesellschaft. Herbicidal N-aryl-substituted nitrogen-containing heterocycles. 5,069,711, Cl. 71-92.000.

Fisher, Karl J.: *See*—
Broadhurst, Michael D.; Cormartie, Thomas H.; Fisher, Karl J.; Haag, William G.; Kanne, David B.; and Leadbetter, Michael R., 5,070,210, Cl. 549-350.000.

Fisher Scientific Company: *See*—
Calabrese, Gary S., 5,070,023, Cl. 436-8.000.

Flanagan, Michael L. Disposable umbrella. 5,069,237, Cl. 135-19.500.

Fleischer, Horst, to Daimler-Benz AG. Exhaust-gas removal duct formed from individual axially mutually adjacent sections for track-forming lanes. 5,069,115, Cl. 454-166.000.

Fleischhacker, Joseph F., Jr., to Lake Region Manufacturing Co., Inc. Steerable guide wire. 5,069,217, Cl. 128-657.000.

Fletcher, John S. Apparatus having pivotable arm for crushing cans. 5,069,121, Cl. 100-137.000.

Flexonics Inc.: *See*—
Sheppard, Michael W., 5,069,487, Cl. 285-226.000.

Flick, Sandra. Vehicle fast food tray. 5,069,375, Cl. 224-273.000.

Fliegel, Frederick M.: *See*—
Cho, Frederick Y.; and Fliegel, Frederick M., 5,070,271, Cl. 310-313.00R.

Flippen, Richard B.: *See*—
Askew, Thomas R.; Flippen, Richard B.; and Subramanian, Munirpallam A., 5,070,070, Cl. 505-1.000.

FlowMole Corporation: *See*—
Chau, Albert W., 5,070,462, Cl. 364-460.000.

FMC Corporation: *See*—
Short, David E.; Ahlstone, Arthur G.; and Valka, William A., 5,069,287, Cl. 166-339.000.
Singeetham, Shiva P., 5,069,288, Cl. 166-348.000.
Weibel, A. Thomas, 5,069,919, Cl. 426-261.000.

Fockens, Tallienco W. H., to N.V. Nederlandsche Apparatenfabriek. Method of checking the loading and unloading of tankers by means of an electromagnetic identification system, and an identification system for use in said method. 5,070,328, Cl. 340-825.540.

Fogal, Rich; King, Jerrold L.; and Moden, Walter L., to Micron Technology, Inc. Method for attaching a semiconductor die to a leadframe using a thermoplastic covered carrier tape. 5,070,042, Cl. 437-220.000.

Fohl, Artur, to TRW Repa GmbH. Force limiter for safety belt restraining systems. 5,069,482, Cl. 280-801.000.

Foller, Werner; and Herbold, Gunter, to GESTRA Aktiengesellschaft. Condensate drain with monitor device. 5,069,247, Cl. 137-558.000.

Fong, Anthony S.: *See*—
Normoyle, Kevin B.; Guyer, James M.; Vogt, Rainer; and Fong, Anthony S., 5,070,475, Cl. 395-375.000.

Fong, Rosamaria; Al-Janby, Harith; and Dahn, Jeffrey R., to Moli Energy Limited. Process of making a rechargeable battery. 5,069,683, Cl. 29-623.100.

Ford Motor Company: *See*—
Boulos, Edward N.; Best, Mark F.; and Surowiec, Roman, 5,070,048, Cl. 501-71.000.
Moulding, Frank E., 5,069,046, Cl. 65-106.000.
Nietering, Kenneth E., 5,069,968, Cl. 428-336.000.
Patil, Prabhakar B.; Miller, John M.; and Masrur, Md. A., 5,070,284, Cl. 318-362.000.
Schmatz, Duane J.; Badgley, John S.; and McHugh, Charles O., 5,069,092, Cl. 82-1.110.

Simko, Aladar O., 5,069,175, Cl. 123-193.00H.

Foreman, Brain E., to Euro Iseki Limited. Liquid level control system. 5,069,243, Cl. 137-205.000.

Form: *See*—
Hladky, Vaclav; and Prokes, Jiri, 5,069,054, Cl. 72-238.000.

Fornaini, Domenico, to Uno-A-Erre Italia S.r.l. Decorative chain of staggered links formed from bent laminar elements. 5,069,028, Cl. 59-80.000.

Forschirm, Alex: *See*—
Chen, Paul N., Sr.; Forschirm, Alex; Glick, Morton; and Jaffe, Michael, 5,070,144, Cl. 525-154.000.

Forschner, Thomas C.: *See*—
Brownscombe, Thomas F.; Forschner, Thomas C.; and Slaugh, Lynn H., 5,070,052, Cl. 502-60.000.

Fossati, Piero; Heidenreich, Holger; Hugl, Herbert; and Wehling, Klaus, to Miles Inc. AS-triazine compounds. 5,070,198, Cl. 544-182.000.

Foster Wheeler Agency Corporation: *See*—
Hansen, Arthur M.; Stevens, William D.; and Winkin, Justin P., 5,069,171, Cl. 122-4.00D.

Foster Wheeler Energy Corporation: *See*—
Gorzegno, Walter P.; Abdulally, Iqbal F.; Phalen, John W.; and Touma, Alfred S., 5,069,170, Cl. 122-4.00D.

Fowler, Donald E.: *See*—
Henderson, Philip B.; Coe, Charles G.; Fowler, Donald E.; and Benson, Montford S., 5,069,690, Cl. 55-67.000.

Fowler, Kerry W., to G. D. Searle & Co. N-benzyltropaneamides. 5,070,094, Cl. 514-304.000.

Fox, Daniel W.: *See*—
Clagett, Donald C.; Fox, Daniel W.; Shafer, Sheldon J.; and Sybert, Paul D., 5,070,177, Cl. 528-196.000.

Fox, James R. System for removing volatile components from water derived from wells. 5,069,796, Cl. 210-664.000.

Framatome: *See*—
Frizot, Alain, 5,069,862, Cl. 376-260.000.

Frametome: *See*—
Lagarrigue, Francis, 5,069,861, Cl. 376-260.000.

Frangioni, John V. Electrophoretic gel forming system. 5,069,773, Cl. 204-299.00R.

Fray, Michael J.: *See*—
Cooper, Melvin; Fray, Michael J.; Richardson, Kenneth; and Steele, John, 5,070,205, Cl. 548-333.000.

Frazier, Judith A.: *See*—
Cook, Jane K. A.; Dolby, Christine A.; Mockett, Albert P. A.; Binns, Matthew M.; Frazier, Judith A.; and Box, Philip, 5,069,902, Cl. 424-89.000.

Freitag, Ladd W.: *See*—
Block, Timothy R.; Ebler, Marcia B.; Freitag, Ladd W.; Heiling, Gerald M.; Holter, Spencer C.; Karst, Dennis L.; Siljenberg, David W.; Soderstrom, Ronald L.; and Trnka, John T., 5,069,522, Cl. 385-39.000.

Freundlich, Lawrence F.; and Karmen, Arthur. Device for effecting safe removal of a used needle. 5,069,667, Cl. 604-110.000.

Frey, Ruedi; and Ruegg, Hans. Process and installation for the recovery of ammonia during the separation of nitrogen oxide from waste gases. 5,069,886, Cl. 423-237.000.

Freyer, Jan; and Nergaard, Arnfinn, to Smedvig IPR A/S. Method and a device for movement-compensation in riser pipes. 5,069,488, Cl. 285-302.000.

Friary, Richard, to Schering Corporation. Imidazo- and pyrimido-quinoline, naphthyridine and pyridopyrazine compounds. 5,070,086, Cl. 514-183.000.

Friedrich, Klaus: *See*—
Schmid, Karl; Meffert, Alfred; Friedrich, Klaus; Langen, Michael; and Herrmann, Klaus, 5,069,817, Cl. 252-351.000.

Frisbie, Michael G. Dental impression tray with level indicator. 5,069,619, Cl. 433-72.000.

Fritsche, Wolf-Eckhart; Lubbehusen, Michael; Kukla, Reiner; and BeiBwenger, Siegfried, to Leybold Aktiengesellschaft. Apparatus for coating substrates by means of a magnetron cathode. 5,069,772, Cl. 204-298.120.

Frizot, Alain, to Framatome. Apparatus for handling a machine for the tensioning of screwed connecting elements. 5,069,862, Cl. 376-260.000.

Fromson, Howard A. Structural unit having hingedly connected tetrahedrons. 5,069,948, Cl. 428-54.000.

Frost, John H. Hand accessory. 5,069,454, Cl. 273-165.000.

Frost, John W.: *See*—
Peters, Norman K.; Frost, John W.; and Long, Sharon R., 5,070,018, Cl. 435-172.300.

Fruchtmann, Romanis: *See*—
Mohrs, Klaus; Perzborn, Elisabeth; Seuter, Friedel; Fruchtmann, Romanis; and Kohlsdorfer, Christian, 5,070,096, Cl. 514-311.000.

FSSL, Inc.: *See*—
Herwig, Harry A.; and Hickok, Doyle D., 5,069,580, Cl. 405-191.000.

Fuchs, Rainer; Wachendorff-Neumann, Ulrike; Becker, Benedikt; Erdelen, Christoph; and Stendel, Wilhelm, to Bayer Aktiengesellschaff. Substituted pyrazoline derivatives, pesticidal compositions and use. 5,070,098, Cl. 514-359.000.

Fuel Tech, Inc.: *See*—
Epperly, William R.; and Sprague, Barry N., 5,069,720, Cl. 106-287.350.

Fuerst, Arpad: *See*—
Reihl, Peter; Fuerst, Arpad; Wingen, Bernhard; Schmid, Alfred; Schreiter, Thomas; and Haendler, Erich, 5,069,500, Cl. 296-214.000.

Fuhrer, Jack S.: *See*—
Isnardi, Michael A.; and Fuhrer, Jack S., 5,070,396, Cl. 358-12.000.

Fuji Electric Co., Ltd.: *See*—
—Fujihira, Tatsuhiko, 5,070,322, Cl. 340-653.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Kobayashi, Toshio, 5,069,305, Cl. 180-249.000.
Makabe, Mitsuru, 5,069,319, Cl. 192-0.052.
Yasuno, Toshio; Thukagoshi, Toshihiro; Hoshii, Shinji; and Imaizumi, Yasuo, 5,069,089, Cl. 76-107.100.

Fuji Photo Film Co., Ltd.: *See*—
Chino, Naoyoshi; Shibata, Norio; and Chikamasa, Hiroshi, 5,069,934, Cl. 427-131.000.
Fujita, Yoshihiro; and Nakamura, Shigeru, 5,070,004, Cl. 430-393.000.
Higashi, Tatsuji; Tsuchiya, Mitsumasa; and Kita, Nobuyuki, 5,069,999, Cl. 430-272.000.
Kotani, Takaaki; and Takada, Seiji, 5,070,352, Cl. 354-402.000.
Nakada, Junji; Takeuchi, Hideaki; and Yasunaga, Tadashi, 5,069,932, Cl. 427-129.000.
Naruse, Hideaki; and Yoshida, Kazuaki, 5,070,003, Cl. 430-389.000.
Tachikawa, Hiromichi; Yokoya, Hiroaki; Watarai, Syu; and Aoai, Toshiaki, 5,069,992, Cl. 430-49.000.
Yasunaga, Tadashi; Kaneko, Shiro; and Sano, Kunihiko, 5,069,933, Cl. 427-130.000.

Fuji Xerox Co., Ltd.: *See*—
Miyake, Hiroyuki, 5,070,236, Cl. 250-208.100.
Sumiya, Kazuhiko; and Sugino, Hajime, 5,070,421, Cl. 360-77.070.

Fujihira, Tatsuhiko, to Fuji Electric Co., Ltd. An overheating detection circuit including a reversely biased junction having a temperature dependent reverse leakage current for detecting overheating of a power integrated circuit. 5,070,322, Cl. 340-653.000.

Fujii, Akio: *See*—
Ishii, Yoshiki; Shimokoriyama, Makoto; Shimizu, Tetsuya; Yoshimura, Katsuji; Fujii, Akio; and Sasatani, Tomohiko, 5,070,402, Cl. 358-135.000.

Fujii, Tukasa: *See*—
Kobayashi, Yoshiyuki; Suehaga, Takashi; Mouri, Isamu; and Fujii, Tukasa, 5,069,724, Cl. 134-37.000.
Suenaga, Takashi; Fujii, Tukasa; and Kobayashi, Yoshiyuki, 5,069,887, Cl. 423-240.00V.

Fujii, Yasuhiro: *See*—
Saruwatari, Masumi; Tsuji, Syoichi; and Fujii, Yasuhiro, 5,069,848, Cl. 264-118.000.

Fujimiya, Hitoshi; Nakajima, Shigeo; and Nasu, Hisanori, to Hitachi Software Engineering Co., Ltd. Electrophoresis pattern reading system of fluorescence type. 5,069,769, Cl. 204-182.800.

Fujimoto, Tetsuo: *See*—
Yuasa, Kimihiro; Hashimoto, Kenji; and Fujimoto, Tetsuo, 5,069,533, Cl. 359-76.000.

Fujinaga, Masato: *See*—
Kunikiyo, Tatsuya; Fujinaga, Masato; and Kotani, Norihiko, 5,070,469, Cl. 364-578.000.

Fujino, Akihiko: *See*—
Ishii, Noriyuki; Hirano, Masayasu; Kajita, Hideo; Kuroda, Hirokazu; Izumi, Shuji; Fujino, Akihiko; Ishimura, Toshihiko; and Seki, Reiji, 5,070,234, Cl. 235-441.000.

Fujioka, Yoshihisa: *See*—
Yamamoto, Masamitsu; Kimura, Noriyuki; Fujioka, Yoshihisa; Yamamoto, Hiroki; and Suekane, Makoto, 5,069,678, Cl. 604-385.100.

Fujishima, Yukio: *See*—
Aoki, Akira; Fujishima, Yukio; Makio, Yusuke; Kusakawa, Susumu; Tsuji, Sadaaki; and Okamura, Tadashi, 5,069,815, Cl. 252-301.360.

Fujita, Isao: *See*—
Arai, Tetsuzo; Yamamoto, Yasushi; Raijo, Mitsuyuki; and Fujita, Isao, 5,069,929, Cl. 427-54.100.

Fujita, Kazuo. Electrically-operated folding stage system. 5,069,006, Cl. 52-7.000.

Fujita, Nagahisa: *See*—
Izumi, Tomoji; Fujita, Nagahisa; and Ito, Yuichi, 5,070,258, Cl. 307-303.000.

Fujita, Yoshihiro; and Nakamura, Shigeru, to Fuji Photo Film Co., Ltd. Bleaching starter and processing of color photographic silver halide photosensitive material using the same. 5,070,004, Cl. 430-393.000.

Fujita, Yoshihiro: *See*—
Nishida, Yasuaki; Fujita, Yoshihiro; Iino, Yoshiki; and Kawada, Norihiko, 5,069,530, Cl. 359-498.000.

Fujitsu Limited: *See*—
Kakuma, Satoshi; Takahashi, Atsuhisa; and Uchida, Yoshihiro, 5,070,498, Cl. 370-60.000.
Shinohara, Tohru; and Tsurumi, Hiroshi, 5,070,420, Cl. 360-75.000.
Suzuki, Eiji, 5,069,156, Cl. 118-52.000.

Fujiwara, Katsuhiro, to Hitachi, Ltd. Sequence controller. 5,070,476, Cl. 395-575.000.

Fujiwara, Noboru: *See*—
Taniguchi, Naohiro; Koike, Syuzo; Watanabe, Yasuhiko; Takeuchi, Tadao; and Fujiwara, Noboru, 5,069,784, Cl. 210-205.000.

Fujiwara, Youichi: *See*—
Kato, Noboru; and Fujiwara, Youichi, 5,069,313, Cl. 188-72.300.

Fujiyoshi, Hitoshi: *See*—
Tamura, Akira; Watanabe, Naotaka; Fujiyoshi, Hitoshi; and Shirota, Masako, 5,069,721, Cl. 106-724.000.
Watababe, Naotaka; Arai, Takao; Fujiyoshi, Hitoshi; and Shirota, Masako, 5,069,754, Cl. 162-168.200.
Fukami, Akira: *See*—
Tsutsumi, Yasuhiro; Yokoya, Yuji; Hara, Yoshimichi; Matsunaga, Eiju; Kawata, Hiroyuki; Fukami, Akira; and Suzuki, Yutaka, 5,069,476, Cl. 280-707.000.
Fukano, Masahiko; and Muraoka, Toshinori, to 501 Mita Industrial Co., Ltd. Fixing device. 5,070,373, Cl. 355-290.000.
Fukazawa, Tsuguo: *See*—
Ohneda, Noboru; Ushioda, Shunta; Arima, Haruo; Hashimoto, Ichiro; Kaneko, Denziro; Sugiyama, Kazuo; Fukazawa, Tsuguo; Tachi, Teruo; and Mukasa, Takashi, 5,069,095, Cl. 82-124.000.
Fukuda, Masatoshi: *See*—
Matsutani, Kanji; and Fukuda, Masatoshi, 5,069,620, Cl. 433-82.000.
Fukuda, Tokuya: *See*—
Kikuchi, Akihiro; and Fukuda, Tokuya, 5,070,408, Cl. 358-227.000.
Fukuda, Yujiro; Utsumi, Shigeo; and Suzuki, Shinobu, to Diafoil Company, Ltd. Shrinkable copolyester film. 5,070,180, Cl. 528-272.000.
Fukui, Kohji: *See*—
Saitoh, Takashi; and Fukui, Kohji, 5,069,605, Cl. 418-55.200.
Fukumoto, Katsuhisa; Kawanishi, Kiyotaka; Nakada, Ryo; and Yamano, Junpei, to Inax Corporation. Skin-surfaced foam glass tile. 5,069,960, Cl. 428-310.500.
Fukumoto, Yasuhiro: *See*—
Ishikawa, Kiichirou; Fukumoto, Yasuhiro; and Dudek, Chet, 5,069,148, Cl. 112-104.000.
Fukushima, Atsuko; Hira, Yasuo; Sato, Hidemi; Kawamoto, Kazumi; Ito, Kenchi; Shiba, Masataka; and Arimoto, Akira. Optical integrated circuit and optical apparatus. 5,070,488, Cl. 360-44.120.
Fukutake, Heiji: *See*—
Mizukami, Hiroshi; and Fukutake, Heiji, 5,069,322, Cl. 192-70.250.
Fukutani, Iwao: *See*—
Sakamoto, Yukio; Hori, Toshio; and Fukutani, Iwao, 5,069,641, Cl. 439-620.000.
Fukutome, Susumu: *See*—
Moritani, Tohei; Fukutome, Susumu; Motoishi, Yasuo; and Oda, Hidemasa, 5,069,946, Cl. 428-36.600.
Fuller, Robert B. High performance motorcycle steering mechanism. 5,069,303, Cl. 180-219.000.
Fuller, William E., to ESCO Corporation. Method of using an austenitic steel alloy as a wear part subject to gouging abrasion type metal loss. 5,069,871, Cl. 420-72.000.
Fulton, Wayne L., to W. A. Whitney Corp. Shear with storable squaring arm. 5,069,099, Cl. 83-468.600.
Funakoshi, Ryohei: *See*—
Niinomi, Toshihiko; Funakoshi, Ryohei; Kaseda, Shigeru; and Takahashi, Koichi, 5,070,468, Cl. 364-550.000.
Furukawa, Teruo: *See*—
Ogawa, Masaharu; Nakajima, Yoshiki; Ito, Osamu; Furukawa, Teruo; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Ototake, Masafumi; and Ozaki, Minoru, 5,070,492, Cl. 369-47.000.
Furushima, Tadashi, to Ricoh Company, Ltd. Variable magnification copier. 5,070,324, Cl. 340-706.000.
Furuya, Takeo: *See*—
Sekine, Shuji; Furuya, Takeo; and Obara, Tetsuya, 5,069,502, Cl. 296-223.000.
G. D. Searle & Co.: *See*—
Fowler, Kerry W., 5,070,094, Cl. 514-304.000.
Gabetta, Bruno; and Giorgi, Raffaello, to IdB Holding SpA. Intermediates useful for the synthesis of delphinidin chloride. 5,070,212, Cl. 549-399.000.
Gabrysch, Anthony R. Internal hydraulic pipe pushing apparatus. 5,069,426, Cl. 254-29.00R.
Gagliardi, Eugene D., Jr., to Designer Foods, Inc. Food product having reduced likelihood of choking. 5,069,914, Cl. 426-76.000.
Gagnon, Steven D.: *See*—
Lind, Eric; Davis, Pauls; and Gagnon, Steven D., 5,070,140, Cl. 525-60.000.
Gahan, James B.: *See*—
Urban, Carl T.; and Gahan, James B., 5,069,438, Cl. 271-10.000.
Gaishin, Michael: *See*—
Estkowski, Michael H.; Estkowski, Christopher G.; and Gaishin, Michael, 5,068,943, Cl. 16-18.00A.
Galinich, Vladimir I.: *See*—
Paton, Boris E.; Podgaetsky, Vladimir V.; Varenchuk, Pavel A.; Privalov, Nikolai T.; Galinich, Vladimir I.; Kovalev, Valentin D.; and Romanenko, Yaroslav A., 5,070,225, Cl. 219-73.000.
Galperin, Lev. Automated multistorey parking building. 5,069,592, Cl. 414-240.000.
Gancthev V., Yura: *See*—
Dam G., Oscar G.; Bueno C., Henry R.; Contreras L., Gerardo A.; Gancthev V., Yura; and Guevara R., Nicolas O., 5,069,716, Cl. 75-495.000.
Garbowicz, Glenn D.; and Perkins, Seymour, III, to North American Philips Corporation. Lamp ignitor with automatic shut-off feature. 5,070,279, Cl. 315-289.000.
Gardner, Robert D.; Hopp, Dineen M.; Shaikh, Aziz S.; and Roberts, Gordon J., to Ferro Corporation. Dielectric compositions. 5,070,047, Cl. 501-16.000.
Gardner, Willis W.: *See*—
Ball, James H.; and Gardner, Willis W., 5,068,965, Cl. 29-898.041.
Garneau, Denis; and Sears, Wen-Hsiu, to International Business Machines Corporation. Method for facilitating the sorting of national language keys in a data processing system. 5,070,456, Cl. 364-419.000.
Gas Research Institute: *See*—
Bruno, Thomas J., 5,070,024, Cl. 436-139.000.
Gascoigne-Melotte B.V.: *See*—
Pera, Anne, 5,069,161, Cl. 119-14.470.
Gascuel, Yves J.; and Cointre, Jean-Pierre, to Oce Graphics France S.A. Writing instrument identification process and device. 5,070,344, Cl. 346-1.100.
Gassmann, Horst-Detlef: *See*—
Obermeier, Josef; Magyari, Eugen; Ritt, Walter; Wohlwend, Ernst; Gassmann, Horst-Detlef; and Cavada, Peter, 5,069,584, Cl. 408-145.000.
Gastinger, Robert G.; and Hayes, John E., to ARCO Chemical Technology, Inc. Polyacrylate graft-polyol dispersants. 5,070,141, Cl. 525-63.000.
Gattermann, Bernd: *See*—
Barlage, Bruno; Robert, Franz-Josef; and Gattermann, Bernd, 5,069,294, Cl. 172-49.500.
Gatti, Luciano: *See*—
Barbieri, Giuseppe; Bordini, Deanna; and Gatti, Luciano, 5,069,341, Cl. 206-365.000.
Gaudette, Roger R.: *See*—
Hwa, Chih M.; Kelly, John A.; Neton, Janet; Scanlon, Patricia M.; and Gaudette, Roger R., 5,069,798, Cl. 210-700.000.
Gavras, Haralambos; and Lammek, Bernard, to Boston University, Trustees of. Pharmacologically effective antagonists of arginine-vasopressin. 5,070,187, Cl. 530-315.000.
Gay, Michel, to Rhone-Poulenc Chimie. Heat-stabilized/non-yellowing chloropolymers. 5,070,128, Cl. 524-357.000.
Gazit, Dan: *See*—
Geballe, Theodore H.; Feigelson, Robert S.; and Gazit, Dan, 5,070,071, Cl. 505-1.000.
Geballe, Theodore H.; Feigelson, Robert S.; and Gazit, Dan, to Leland Stanford Junior University, The Board of Trustees of the. Method of forming a ceramic superconducting composite wire using a molten pool. 5,070,071, Cl. 505-1.000.
Gebr. Hennig GmbH: *See*—
Stohr, Albert; and Rehle, Alfred, 5,069,327, Cl. 198-725.000.
Gebruder Linck Maschinenfabrik "Gatterlinck" GmbH & Co. KG, Firma: *See*—
Goenner, Siegmar, 5,069,977, Cl. 428-537.100.
GEC Plessey Telecommunications Limited: *See*—
Hardwick, David W., 5,069,521, Cl. 385-24.000.
Gediga, Josef: *See*—
Reuter, Wolfgang; and Gediga, Josef, 5,069,269, Cl. 164-325.000.
Gellert, Roland: *See*—
Dersch, Rolf; Dehne, Heinrich; Gellert, Roland; Mueller, Dietrich-Wolfgang; Vinke, Johannes; and Wistuba, Eckehardt, 5,070,136, Cl. 524-555.000.
Gemco Ware, Inc.: *See*—
Schlessel, Walter, 5,069,117, Cl. 99-419.000.
Gemmell, Peter A.: *See*—
Bradbury, Roy; Gemmell, Peter A.; and Hann, Richard A., 5,070,069, Cl. 503-227.000.
GenCorp Inc.: *See*—
Miller, William H., 5,069,853, Cl. 264-176.100.
General Cryogenics Incorporated: *See*—
Martin, Patrick S., 5,069,039, Cl. 62-50.300.
General Dynamics Land Systems, Inc.: *See*—
Cory, Robert M., 5,069,510, Cl. 305-58.0PC.
General Electric Company: *See*—
Aycock, David F.; and Ting, Sai-Pei, 5,069,818, Cl. 525-397.000.
Clagett, Donald C.; Fox, Daniel W.; Shafer, Sheldon J.; and Sybert, Paul D., 5,070,177, Cl. 528-196.000.
Cohen, Clark E., 5,070,338, Cl. 342-355.000.
Dillmann, Charles W., 5,069,860, Cl. 376-235.000.
Eckberg, Richard P., 5,070,118, Cl. 522-99.000.
Germer, Warren R.; Coryea, Peter F.; and Stillwagon, Jacob M., 5,068,962, Cl. 29-830.000.
Giles, Harold F., Jr.; and Schlich, William R., 5,070,142, Cl. 525-66.000.
Hammer, Jacob M., 5,070,508, Cl. 372-44.000.
Isnardi, Michael A.; and Fuhrer, Jack S., 5,070,396, Cl. 358-12.000.
Johansson, Eric B., 5,069,864, Cl. 376-441.000.
Larson, Richard I.; Dada, Abdul G.; and Harmon, John L., 5,069,888, Cl. 423-260.000.
Lobos, John H.; Leib, Terry K.; and Su, Tah-Mun, 5,070,017, Cl. 435-170.000.
Magnon, Gary D.; Seymour, Raymond K.; Lesslie, David J.; Guerrette, Michael C.; and McKay, Geoffrey H., 5,070,361, Cl. 335-172.000.
Moore, James H., 5,069,030, Cl. 60-39.270.
Siemers, Paul A.; and Rutkowski, Stephen F., 5,070,228, Cl. 219-121.460.
Walker, Loren H., 5,070,440, Cl. 363-71.000.
Watson, Edwin G., 5,070,487, Cl. 369-13.000.
General Electric Corporation: *See*—
Teutsch, Erich O.; and Coyle, Dennis J., 5,069,612, Cl. 425-133.100.
General Motors Corporation: *See*—
Baldwin, David P.; Du Toit, Stephanus F.; and Mirkin, Jose A., 5,069,501, Cl. 296-223.000.
Sherman, James F., 5,069,656, Cl. 475-276.000.
Smith, Paul R.; Wolfgram, Orval F.; and Kobelia, Rudolph G., 5,069,329, Cl. 198-752.000.

General Ribbon Corporation: *See—*
Daggs, Robert W., 5,069,563, Cl. 400-208.000.
General Signal Corporation: *See—*
Hollman, Richard F., 5,070,235, Cl. 250-201.100.
Rhodes, Bruce R.; Bollinger, Dave; and Dombrowski, Mark, 5,070,251, Cl. 307-46.000.
Genicom Corporation: *See—*
Stephens, Fred O., 5,069,566, Cl. 400-656.000.
Gentile, Anthony J.: *See—*
Fink, Cameron L.; and Gentile, Anthony J., 5,069,567, Cl. 402-3.000.
Gentile, Wayne F.; and Kliman, Harvey L., to Du Pont de Nemours, E. I., and Company. Structural composites of fluoropolymers reinforced with continuous filament fibers. 5,069,959, Cl. 428-294.000.
Geo-Microbial Technologies, Inc.: *See—*
Hitzman, Donald O., 5,069,787, Cl. 210-259.000.
George, Richard A.: *See—*
Blankenship, David J.; George, Richard A.; and Czaplewski, Steven E., 5,068,948, Cl. 24-115.00A.
Georgetown University: *See—*
McRae, Donald A., 5,069,223, Cl. 128-734.000.
Geprags, Peter: *See—*
Vetter, Helmut; and Geprags, Peter, 5,069,670, Cl. 604-243.000.
Gericke, Stephen H., to Safe Medical Devices Inc. Intravenous admixture protective device. 5,069,666, Cl. 604-86.000.
Gerling, Klaus-Guenter; and Wilke, Detlef, to Kali-Chemie AG. Washing or detergent composition containing lactobionic acid or lactobionic acid salts. 5,069,808, Cl. 252-99.000.
Germer, Warren R.; Coryea, Peter F.; and Stillwagon, Jacob M., to General Electric Company. Method of fabricating an energy meter. 5,068,962, Cl. 29-830.000.
Gershman, Russell J.: *See—*
Stein, Jay A.; Plewes, Donald B.; Gershman, Russell J.; Liebau, James G.; and Williams, John N., 5,070,519, Cl. 378-146.000.
Gerum, Johannes; Schulz, Horst; and Sauter, Jurgen, to BASF Magnetics GmbH. Method of preparing a magnetic recording medium. 5,069,931, Cl. 427-128.000.
Gerzberg, Levy: *See—*
Sinar, Alexander B.; Gerzberg, Levy; Shacham, Yosef Y.; Blech, Ilan A.; and Sirkin, Eric R., 5,070,383, Cl. 357-51.000.
GESTRA Aktiengesellschaft: *See—*
Foller, Werner; and Herbold, Gunter, 5,069,247, Cl. 137-558.000.
Getzlaff, Klaus J.: *See—*
Dao-Trong, Son; Getzlaff, Klaus J.; and Helwig, Klaus, 5,070,471, Cl. 364-760.000.
Gibbs, Glen A.; and Johnson, Arnold T., to ITT Corporation. Non-corrosive double-walled tube and proces for making the same. 5,069,381, Cl. 228-132.000.
Gibbs & Hill Espanola: *See—*
Alba, Emilio C., 5,069,387, Cl. 239-18.000.
Gibbs, W. Scott: *See—*
Petrovic, John J.; Honnell, Richard E.; and Gibbs, W. Scott, 5,069,841, Cl. 264-86.000.
Gidman, Claude J.: *See—*
Kaufman, William H.; Harrison, Frederick A.; Gidman, Claude J.; and Beekenkamp, Gerald, 5,068,984, Cl. 36-117.000.
Gilbert, David L.: *See—*
Bauer, David M.; and Gilbert, David L., 5,069,631, Cl. 439-159.000.
Gilbert Wan: *See—*
Braconnier, Ed, 5,069,464, Cl. 280-47.350.
Giles, Harold F., Jr.; and Schlich, William R., to General Electric Company. Polyetherimide-asa blends. 5,070,142, Cl. 525-66.000.
Gill, Ajit S. Compact multi-stage pressure reducing valve. 5,069,248, Cl. 137-613.000.
Gillenwater, R. Lee. Abrasive engraving process. 5,069,004, Cl. 51-310.000.
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Narula, Anubhav P. S.; De Virgilio, John J.; Benaim, Carlos; Ouwerkerk, Anton V.; and Gillotin, Olivier, 5,070,073, Cl. 512-13.000.
Gilmore, John P.; and Clark, Dereck B., to Honeywell Inc. Method of analyzing and predicting both airplane and engine performance characteristics. 5,070,458, Cl. 364-424.060.
Giorgi, Raffaello: *See—*
Gabetta, Bruno; and Giorgi, Raffaello, 5,070,212, Cl. 549-399.000.
Gipson, Thomas C. Fluid-powered subsurface pump. 5,069,602, Cl. 417-399.000.
Girovich, Mark J., to Bio Gro Systems, Incorporated. Indirect heat drying and simultaneous pelletization of sludge. 5,069,801, Cl. 210-770.000.
Gitzel, Jorg; Macholdt, Hans-Tobias; Sieber, Alexander; Wehowsky, Frank; and Prossel, Gunther, to Hoechst Aktiengesellschaft. Use of colorless, intensely fluorinated ammonium and iminium compounds as charge control agents for electrophotographic recording processes. 5,069,994, Cl. 430-110.000.
Gladh, Olov H.; and Kagstrom, Leif S., to Telefonaktiebolaget L M Ericsson. Tuning arrangement for combiner filter having dielectric waveguide resonator and coacting tuning capacitance. 5,070,313, Cl. 333-202.000.
Glans, Jeffrey H.; and Akkapeddi, Murali K., to Allied-Signal Inc. Use of phosphoroustrislactams as compatibilizing agents for polyphenylene oxide/polyester blends. 5,070,152, Cl. 525-397.000.
Glassey, Paul. Loading and unloading arrangement for a cable transportation system. 5,069,140, Cl. 104-28.000.
Glenn, Brian J., to Imo Industries, Inc. Flow-switch construction. 5,070,220, Cl. 200-81.90M.
Glick, Morton: *See—*
Chen, Paul N., Sr.; Forschirm, Alex; Glick, Morton; and Jaffe, Michael, 5,070,144, Cl. 525-154.000.
Globe Environmental Protection, Inc.: *See—*
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Glocker, David A., to Eastman Kodak Company. Sputtering process employing an enclosed sputtering target. 5,069,770, Cl. 204-192.120.
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GMS Engineering Corporation: *See—*
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Godard, Jacques; and Schneider, Bernard, to Cebal. Dispenser body, a dispenser comprising such a body and the corresponding dome. 5,069,368, Cl. 222-321.000.
Goenner, Siegmar, to Gebruder Linck Maschinenfabrik "Gatterlinck" GmbH & Co. KG, Firma. Method of producing a multi-ply solid wood structure. 5,069,977, Cl. 428-537.100.
Goff, Jerry K., to Performance Controls, Inc. Pulse-width modulated circuit for driving a load. 5,070,292, Cl. 318-811.000.
Gofuku, Eishi: *See—*
Ohuchida, Hirofumi; Gofuku, Eishi; Takasago, Hayato; Ishizu, Akira; Tobita, Toshio; and Takada, Mitsuyuki, 5,069,745, Cl. 156-630.000.
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Goldenberg, Merrill S.: *See—*
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Goldstar Electron Co., Ltd.: *See—*
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Golinelli, Guido: *See—*
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Gonder, Warren W. Parabolic solar collector body and method. 5,069,540, Cl. 350-631.000.
Gonet, Helen F. Method for repairing broken umbrellas. 5,068,955, Cl. 29-402.090.
Gonsalves, Mario: *See—*
MacKendrick, Robert R.; and Gonsalves, Mario, 5,068,919, Cl. 2-2.10A.
Good, Stanley B., to Allied-Signal Inc. Air bag retainer assembly. 5,069,480, Cl. 280-743.000.
Goodman, Robert M., Jr. Loom harness system with spaced parallel rotating shafts. 5,069,256, Cl. 139-83.000.
Goodman, Steven F.: *See—*
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Goodyear Tire & Rubber Company, The: *See—*
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Gorre, Luisa E.: *See—*
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Gorzegno, Walter P.; Abdulally, Iqbal F.; Phalen, John W.; and Touma, Alfred S., to Foster Wheeler Energy Corporation. Fluidized bed combustion system and method having an integral recycle heat exchanger with inlet and outlet chambers. 5,069,170, Cl. 122-4.00D.
Gosse, August-Wilhelm: *See—*
Burst, Hermann; Gosse, August-Wilhelm; Scadlich, Gunter; and Hotzer, Georg, 5,069,499, Cl. 296-201.000.
Gosselin, Francis, to Quebec Metal Powders Limited. Segregation-free metallurgical powder blends using polyvinyl pyrrolidone binder. 5,069,714, Cl. 75-252.000.
Goto, Narito: *See—*
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Grabowski, Edward J. J.: *See*—
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Grabowski, Wojciech, to Union Carbide Chemicals and Plastics Technology Corporation. Process for making flexible polyurethane foam. 5,070,112, Cl. 521-112.000.

Graf, Ernst; Karel, Marcus; and Saguy, Israel A., to Pillsbury Company, The; and Massachusetts Institute of Technology. Method of coloring foods. 5,069,918, Cl. 426-243.000.

Graff, Ernest A.: *See*—
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Graffin, Jean-Jacques, to Ets. A. Bertaud. Aseptic volumetric packaging apparatus. 5,069,366, Cl. 222-152.000.

Grandjean, Pierre-Andre, to Medtronic, Inc. Muscle stimulator with variable duty cycle. 5,069,680, Cl. 623-3.000.

Grantham, David S. Urethra prosthetic for relieving prostatic problems. 5,069,660, Cl. 600-30.000.

Gras, Elie: *See*—
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Gravemann, Horst, to KM-Kabel Metall AG. Continuous casting mold. 5,069,270, Cl. 164-481.000.

Gray, Kenneth W., to McQueen, Joe C., Jr., a part interest. Wear resistant rod guide. 5,069,284, Cl. 166-311.000.

Green, William D. Smoke generating apparatus. 5,069,230, Cl. 131-330.000.

Greenwald, Anton C.; and Buchanan, Bobby L., to Spire Corporation. Process of making a ferroelectric electronic component and product. 5,070,026, Cl. 437-3.000.

Greenwood, Brian F.: *See*—
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Greigger, Paul D.: *See*—
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Grennan, Robert; Rice, John; and Squier, Steven, to Sundstrand Corporation. Fully integrated inert gas and oxidizer replenishment system. 5,069,692, Cl. 55-158.000.

Griffith, Lionell K., to Olganix Corporation. Reference marker orientation system for a radiographic film-based computerized tomography system. 5,070,454, Cl. 364-413.130.

Griffiths, Clifford H.: *See*—
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Grigsby, John M., to North American Container Corporation. Support pad and a pallet with sockets for a wood reinforced corrugated paperboard shipping container. 5,069,338, Cl. 206-319.000.

Grindstaff, Teddy H.; and Reese, Cecil E., to Du Pont de Nemours, E. I., and Company. Improvements in process for preparing crystalline spin-oriented filaments. 5,069,844, Cl. 264-103.000.

Grindstaff, Teddy H.; and Reese, Cecil E., to Du Pont de Nemours, E. I., and Company. Improvements in process for preparing spin-oriented feed yarns. 5,069,845, Cl. 264-103.000.

Grindstaff, Teddy H.; and Reese, Cecil E., to Du Pont de Nemours, E. I., and Company. Process for preparing drawn filament yarns. 5,069,846, Cl. 264-103.000.

Grindstaff, Teddy H., to Du Pont de Nemours, E. I., and Company. Improvements in process for preparing spun yarns. 5,069,847, Cl. 264-103.000.

Grodinsky, Robert M.; and Cornwell, David G. Electroacoustic transducers with increased magnetic stability for distortion reduction. 5,070,530, Cl. 381-201.000.

Groll, Manfred: *See*—
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Groman, Ernest V.; Josephson, Lee; and Lewis, Jerome M., to Advanced Magnetics Inc. Silanized biodegradable super paramagnetic metal oxides as contrast agents for imaging the gastrointestinal tract. 5,069,216, Cl. 128-653.400.

Grondalski, David S., to Digital Equipment Corporation. Bus transmitter having controlled trapezoidal slew rate. 5,070,256, Cl. 307-270.000.

Grosboll, Martin P., to Atlantic Richfield Company. Heavy crude upgrading using remote natural gas. 5,069,775, Cl. 208-108.000.

Grosh Scenic Studios, Inc.: *See*—
Jenne, James F., 5,069,011, Cl. 52-144.000.

Grossi, Renzo. Method and apparatus for continuously packaging batches of containers or the like. 5,069,016, Cl. 53-398.000.

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Gruell, Robert: *See*—
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Grumman Aerospace Corporation: *See*—
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Grunbaum, Francisco A.: *See*—
Singer, Jerome R.; Grunbaum, Francisco A.; Kohn, Philip D.; Zubelli, Jorge P.; Couch, John L.; Naparst, Harold L.; and Latham, Geoffrey, 5,070,455, Cl. 364-413.190.

Gruver, Morris E., III: *See*—
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GTE Laboratories Incorporated: *See*—
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GTE Products Corporation: *See*—
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Guerrette, Michael C.: *See*—
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Guess, Joe F.; and Zalesky, Paul J., to Inter Therapy, Inc. Intravascular ultrasonic angioplasty probe. 5,069,664, Cl. 604-22.000.

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Guiton, Jeremy D. L., to Shell Internationale Research Maatschappij B.V. Structural materials. 5,069,737, Cl. 156-210.000.

Gulardini S.p.A.: *See*—
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Guldner, Karlheinz: *See*—
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Gum, Ernest K.: *See*—
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Gunderson, Barbara A.: *See*—
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Gunderson, Thomas; and Gunderson, Barbara A. Infant nursing apparatus. 5,069,351, Cl. 215-11.100.

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Watanabe, Shinpei; Watanabe, Yasuto; Ikeda, Yuzi; Gunji, Keiichiro; and Niikawa, Ryo, 5,069,524, Cl. 385-59.000.

Gunze Limited: *See*—
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Gupta, Ajay K.: *See*—
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Gutierrez, Jean-Marie, to Digital Equipment Corporation. Method of fabricating interconnect layers on an integrated circuit chip using seed-grown conductors. 5,069,749, Cl. 156-646.000.

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H. Krantz GmbH & Co.: *See*—
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H.P.E. Corporation: *See*—
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Ha, Yeong L.: *See*—
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Haag, Werner O.; and Tsikoyiannis, John G., to Mobil Oil Corp. Separation of mixture components over membrane composed of a pure molecular sieve. 5,069,794, Cl. 210-650.000.

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Haase, Dieter; Spiratos, Nelu; and Jolicoeur, Carmel, to Handy Chemicals Limited. Polymeric basic aluminum silicate-sulphate. 5,069,893, Cl. 423-556.000.

Haberkorn, Axel: *See*—
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Hachikawa, Syuiti: *See*—
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Hachikawa, yuiti: *See*—
Okumura, Toshikata; Nakamura, Yukio; Yoneoka, Noriei; and Hachikawa, yuiti, 5,069,832, Cl. 264-23.000.

Hadley, Benjamin H. Flexible hose assembly. 5,069,253, Cl. 138-109.000.

Hadley, LeMoyne F., to Hewlett-Packard Company. Apparatus and method using a combined read/write head for processing and storing read signals and for providing firing signals to thermally actuated ink ejection elements. 5,070,410, Cl. 358-296.000.

Haendler, Erich: *See*—
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Hagopian, Mark, to Biologics, Inc. Flotation therapy bed having two part construction. 5,068,935, Cl. 5-451.000.

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Halasa, Adel F.: *See*—
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Hall, Eugene W.: *See*—
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Hall, Kevin R.: *See*—
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Hall, Steven E.; and Stein, Philip D., to E. R. Squibb & Sons, Inc. Arylthioalkylphenyl carboxylic acids, derivatives thereof, compositions containing same method of use. 5,070,099, Cl. 514-381.000.

Hallberg, David E., to Revolution Fuels of America, Inc. Integrated process for producing ethanol, methanol and butyl ethers. 5,070,016, Cl. 435-132.000.

Halliburton Company: *See*—
Poulsen, Don K., 5,070,457, Cl. 364-420.000.

Halpern, Arieh S.: *See*—
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Hama, Susumu: *See*—
Murata, Sadao; Harada, Yasuhiro; and Hama, Susumu, 5,069,123, Cl. 101-93.210.

Hamada, Toshiaki: *See*—
Yonekawa, Takashi; Buma, Shuuichi; Aburaya, Toshio; Sato, Kunihito; Kawanishi, Masaki; Hamada, Toshiaki; and Tagawa, Shinichi, 5,069,475, Cl. 280-707.000.

Hamaguchi, Kunikazu; Harada, Takashi; and Hamanaka, Toshiyuki, to NGK Insulators, Ltd. Porous ceramic honeycomb filter and method of producing the same. 5,069,697, Cl. 55-523.000.

Hamanaka, Toshiyuki: *See*—
Hamaguchi, Kunikazu; Harada, Takashi; and Hamanaka, Toshiyuki, 5,069,697, Cl. 55-523.000.

Hamatani, Toshiji: *See*—
Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, 5,069,531, Cl. 359-55.000.

Hamblin, Gerald M.: *See*—
Allen, William C.; Pye, Stephen D.; Hamblin, Gerald M.; Perez, Jose M.; Amend, William E.; Bush, John D.; Holligan, David; and Pyle, Delbert E., 5,069,485, Cl. 285-55.000.

Hammer, Jacob M., to General Electric Company. Semiconductor laser with adjustable light beam. 5,070,508, Cl. 372-44.000.

Hamprecht, Gerhard: *See*—
Westphalen, Karl-Otto; Hamprecht, Gerhard; Wuerzer, Bruno; and Meyer, Norbert, 5,069,710, Cl. 71-92.000.

Han, James C.: *See*—
Jeutter, Dean C.; Josse, Fabien J.; and Han, James C., 5,069,210, Cl. 128-420.600.

Hanada, Mariko; Kazuo, Okino; and Kazunari, omatsu, to Figaro Engineering, Inc. Exhaust gas sensor and process for producing same. 5,070,318, Cl. 338-34.000.

Hanaoka, Osamu: *See*—
Seki, Masaki; Samukawa, Koji; and Hanaoka, Osamu, 5,070,464, Cl. 364-474.340.

Hanaoka, Yukihiro: *See*—
Mochizuki, Seiji; Naka, Takahiro; Hara, Kazuhiko; Takagi, Akira; and Hanaoka, Yukihiro, 5,070,346, Cl. 346-140.00R.

Handy Chemicals Limited: *See*—
Haase, Dieter; Spiratos, Nelu; and Jolicoeur, Carmel, 5,069,893, Cl. 423-556.000.

Hanisch, Helmut: *See*—
Kersten, Peter; and Hanisch, Helmut, 5,069,517, Cl. 385-130.000.

Hann, Richard A.: *See*—
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Hansa Metallwerke AG: *See*—
Ostertag, Ulrich K.; and Ostertag, Reinhard F., 5,069,249, Cl. 137-625.400.

Hansen, Arthur M.; Stevens, William D.; and Winkin, Justin P., to Foster Wheeler Agency Corporation. Fluidized bed combustion system and method having an integral recycle heat exchanger with a transverse outlet chamber. 5,069,171, Cl. 122-4.00D.

Hansen, Henning M.; and Voss, Frands W., to Danfoss A/S. Mass flow meter working on the coriolis principle. 5,069,075, Cl. 73-861.380.

Hansen, Steven M., to Du Pont de Nemours, E. I., and Company. Processing ethylene terephthalate/hexahydroterephthalate copolymer filaments. 5,069,843, Cl. 264-103.000.

Hanson, Steven P.; and Williams, Bartley E., to Quaker Oats Company, The. Toy sawable wood. 5,069,646, Cl. 446-85.000.

Hara, Akira; Sukigara, Mitsunori; and Takagi, Toshisaburo, to B-J Trading Limited. Device for cleaning a cylinder of a printing machine. 5,069,128, Cl. 101-425.000.

Hara, Kazuhiko: *See*—
Mochizuki, Seiji; Naka, Takahiro; Hara, Kazuhiko; Takagi, Akira; and Hanaoka, Yukihiro, 5,070,346, Cl. 346-140.00R.

Hara, Shigeyoshi; and Nakatani, Umewaka, to Hercules Incorporated. Process for producing modified molded polymer article. 5,069,943, Cl. 427-400.000.

Hara, Takafumi: *See*—
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Hara, Yoshimichi: *See*—
Tsutsumi, Yasuhiro; Yokoya, Yuji; Hara, Yoshimichi; Matsunaga, Eiju; Kawata, Hiroyuki; Fukami, Akira; and Suzuki, Yutaka, 5,069,476, Cl. 280-707.000.

Harada, Masana, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device and method of manufacturing the same. 5,070,377, Cl. 357-23.400.

Harada, Takashi: *See*—
Hamaguchi, Kunikazu; Harada, Takashi; and Hamanaka, Toshiyuki, 5,069,697, Cl. 55-523.000.

Harada, Yasuhiro: *See*—
Murata, Sadao; Harada, Yasuhiro; and Hama, Susumu, 5,069,123, Cl. 101-93.210.

Haraguchi, Shosuke; Kawamura, Masaharu; and Morishima, Hideki, to Canon Kabushiki Kaisha. Camera. 5,070,349, Cl. 354-152.000.

Harari, Eliyahou: *See*—
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Harber, Blair, Jr.: *See*—
Travis, Terrell; Shagott, David; Kruse, Gary; Sutherland, Daniel; and Harber, Blair, Jr., 5,069,691, Cl. 55-126.000.

Harbolt, Bruce A.; and Murata, Perry L., to Union Oil Company of California. Transportable cargo container. 5,069,352, Cl. 220-1.500.

Harding, Kevin G., to Industrial Technology Institute. Moire contouring camera. 5,069,549, Cl. 356-376.000.

Hardwick, David W., to GEC Plessey Telecommunications Limited. Optical transmission apparatus. 5,069,521, Cl. 385-24.000.

Harirchian, Bijan: *See*—
Humphreys, Robert W. R.; Harirchian, Bijan; and Smeets, Frans L. M., 5,069,812, Cl. 252-186.440.

Harmon, John L.: *See*—
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Haroutel, Jean-claude, to Alcatel Satmam. Letter scale and franking machine incorporating same. 5,069,299, Cl. 177-25.150.

Harper, Mark J.: *See*—
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Harris Corporation: *See*—
Moore, Charles H.; and Murphy, Robert W., 5,070,451, Cl. 395-375.000.
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Wade, William R.; and Ports, Kenneth A., 5,070,388, Cl. 357-68.000.

Harris, Frank W.: *See*—
Bartelt, James T.; Harris, Frank W.; and Owens, Alan R., 5,069,211, Cl. 128-421.000.

Harris, Ivor R.; and Safi, Syed H., to University of Birmingham, The. Permanent magnets and method of making. 5,069,713, Cl. 75-232.000.

Harris, Jerry M.: *See*—
Yin, Hezhu; Harris, Jerry M.; and Nur, Amos M., 5,069,308, Cl. 181-106.000.

Harris, Kenneth; and Erickson, Gary L., to Cannon-Muskegon Corporation. Low carbon directional solidification alloy. 5,069,873, Cl. 420-448.000.

Harrison, Frederick A.: *See*—
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Harrison, Jeffrey B.: *See*—
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Hart, Richard S.; and Perdue, Thomas E., Jr., to Duraco Products, Inc. Fastener. 5,068,945, Cl. 16-114.00B.

Harvey, Donald M., to Eastman Kodak Company. Field curvature effects minimized in tele/pan camera. 5,070,350, Cl. 354-195.100.

Harz, Gerhard; and Reichl, Erwin, to Sachsenwerk Aktiengesellschaft. Encapsulated switching system with longitudinal coupling of bus bars, inner partitions, and coupling fields. 5,070,428, Cl. 361-341.000.

Hasan, Syed R.; Packard, Mark A.; and Ditka, Michael P., to Illinois Tool Works Inc. Anchoring device. 5,069,588, Cl. 411-439.000.

Haser Company Limited, The: *See*—
Wells, Alan A., 5,069,688, Cl. 55-25.000.

Hashiguchi, Masahiro: *See—*
Inoue, Kazuo; Sano, Shoichi; Ogura, Misami; Nagahiro, Kenichi; Konno, Tsuneo; Kajiwara, Hajime; Ono, Yoshinobu; Yoshida, Suguru; Shimada, Hiroo; and Hashiguchi, Masahiro, 5,069,306, Cl. 180-291.000.

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Hashimoto, Koichi: *See—*
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Hashimoto, Masanori: *See—*
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Hashimoto, Masashi, to Texas Instruments Incorporated. Signal transmission circuit. 5,070,262, Cl. 307-475.000.

Hashimoto, Masashi: *See—*
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Hashimoto, Yoshio: *See—*
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Hasimoto, Shoji: *See—*
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Haslett, Robert A.; Kosson, Robert L.; and Solon, Martin, to Grumman Aerospace Corporation. Spacecraft radiator system. 5,069,274, Cl. 165-32.000.

Haslund, Ralph L., to Boeing Company, The. Stabilized aero-optical free shear layer interface. 5,069,397, Cl. 244-1.00R.

Hasselmann, Heinrich: *See—*
Zillgitt, Ulrich; Speer, Harald; Haug, Kurt; Ebinger, Georg; Millers, Miervaldis; and Hasselmann, Heinrich, 5,070,433, Cl. 362-66.000.

Hattori, Kazuo; and Taniguchi, Mitsuhiro, to Nippon Mining Co., Ltd. Method for producing a III–V compound semiconductor device with a phosphoric oxide insulating layer. 5,070,035, Cl. 437-184.000.

Hatwar, Tukaram K.; Palumbo, Anthony C., Jr.; and Stinson, Douglas G., to Eastman Kodak Company. Overwritable magnetooptical recording element including first and second magnetic layers, with one of which containing zirconium. 5,069,984, Cl. 428-694.000.

Haubner, Georg; and Zobl, Hartmut, to Robert Bosch GmbH. Coordinated circuit for supplying power from a D-C source to a microcomputer and its semiconductor memories. 5,070,481, Cl. 365-228.000.

Haug, Kurt: *See—*
Zillgitt, Ulrich; Speer, Harald; Haug, Kurt; Ebinger, Georg; Millers, Miervaldis; and Hasselmann, Heinrich, 5,070,433, Cl. 362-66.000.

Hautvast, Heinz-Josef; Adams, Jurgen; and Sieber, Isa, to Mannesmann Kienzle GmbH. Contact arrangement for electrical interrogation of the data of a wheel revolution counter. 5,069,624, Cl. 439-16.000.

Haven Corporation: *See—*
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Hawe, William R.; Tardo, Joseph J.; Kaufman, Charles W.; Gupta, Amar; Spinney, Barry A.; and Waters, Gregory M., to Digital Equipment Corporation. Generic encryption technique for communication networks. 5,070,528, Cl. 380-48.000.

Hayabuchi, Masahiro: *See—*
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Hayakawa, Masahiro; and Kosako, Kosei, to Asahi Kogaku Kogyo Kabushiki Kaisha. Waterproof and/or water-resistant camera. 5,070,348, Cl. 354-64.000.

Hayden, James D.: *See—*
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Hayes, John E.: *See—*
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Hayes Microcomputer Products, Inc.: *See—*
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Hazenbroek, Jacobus E. Keel bone cutter. 5,069,652, Cl. 452-165.000.

Health Research Inc.: *See—*
Parsons, Linda M.; Bopp, Lawrence; Waring, Alfred L.; and Shayegani, Mehdi, 5,070,011, Cl. 435-6.000.

Healy, Brian C. Stringed instrument support device. 5,069,103, Cl. 84-327.000.

Heath Consultants Incorporated: *See—*
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Heaton, Jeff S.: *See—*
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Hegedus, Denes A.: *See—*
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Heiling, Gerald M.: *See—*
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Heim, Hans: *See—*
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Heine, Wilhelm: *See—*
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Hellberg International Limited: *See—*
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Helling, Gunter: *See—*
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Helwig, Klaus: *See—*
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Henderson, Henning M. Food steaming apparatus. 5,069,198, Cl. 126-369.000.

Henderson, Philip B.; Coe, Charles G.; Fowler, Donald E.; and Benson, Montford S., to Air Products and Chemicals, Inc. Process for kinetic gas-solid chromatographic separations. 5,069,690, Cl. 55-67.000.

Henderson, Thomas D.: *See—*
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Henderson, William A., to Zebco Corporation. Kill function for a steered trolling motor. 5,069,642, Cl. 440-6.000.

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Henkel Kommanditgesellschaft auf Aktien: *See—*
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Henley International, Inc.: *See—*
Henley, Ernest J., 5,069,908, Cl. 421-449.000.

Hennen, Heinz J., to Draftex Industries Limited. Apparatus for fitting flexible strips. 5,068,952, Cl. 29-235.000.

Henningsen Foods, Inc.: *See—*
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Henry Pratt Company: *See—*
Kurkjian, Gregory A., Jr., 5,069,240, Cl. 137-15.000.

Herbert, William G.; Andrews, John R.; and Griffiths, Clifford H., to Xerox Corporation. Process for suppressing the plywood effect in photosensitive imaging members. 5,069,758, Cl. 205-73.000.

Herbold, Gunter: *See—*
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Hercules Incorporated: *See—*
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Herkes, Frank E., to Du Pont de Nemours, E. I., and Company. Cyanobutylation of amines with 2-pentenitrile. 5,070,202, Cl. 544-402.000.

Herman Miller, Inc.: *See—*
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Hermanns, Hans: *See—*
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Herrin, Melvin B.; and Mazurek, Richard, to Klearfold, Inc. Container. 5,069,334, Cl. 206-45.340.

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Herron, Jeffrey W.: *See—*
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Herzenberg, Leonard A.: *See—*
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Herzog, Klaus; and Breyer, Karl-Hermann, to Carl-Zeiss. Coordinate-measuring machine. 5,068,972, Cl. 33-503.000.

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Heuvelsland, Albert J., to Dow Chemical Company, The. Production of polyether polyols with reduced unsaturation. 5,070,125, Cl. 124-155.000.

Hewlett-Packard Company: *See*—
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Hadley, LeMoyne F., 5,070,410, Cl. 358-296.000.
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Kappele, William D., 5,069,718, Cl. 106-22.000.
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Hicks, Clark T.; Hoffman, Ray D.; and Thompson, James E., H_2-to Aristech Chemical Corporation. ABS/Acrylic lamination process. 5,069,851, Cl. 264-171.000.

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Hietala, Alexander W.; and Rabe, Duane C., to Motorola, Inc. Multiple latched accumulator fractional N synthesis. 5,070,310, Cl. 331-1.00A.

Higashi, Tatsuji; Tsuchiya, Mitsumasa; and Kita, Nobuyuki, to Fuji Photo Film Co., Ltd. PS plate for making lithographic printing plate requiring no dampening water. 5,069,999, Cl. 430-272.000.

Higberg, Brian J.: *See*—
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Higuchi, Yoshiharu; and Ito, Kazuhisa, to Brother Kogyo Kabushiki Kaisha. Motor driving device for sewing machine. 5,069,149, Cl. 112-277.000.

Hildebrand, Victor F. Electric conduction cooking method. 5,069,920, Cl. 426-234.000.

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Hilti Aktiengesellschaft: *See*—
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Hinterwaldner, Rudolf; and Bolte, Georg, to Schmalbach Lubeca AG. Solvent-free, low-monomer or monomer-free polymerizable hot melt composition. 5,070,121, Cl. 524-31.000.

Hinz, Alexander, to Carl-Zeiss-Stiftung. Laser radar system. 5,069,545, Cl. 356-28.500.

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Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, to Kuraray Co., Ltd. Process for producing polyurethane. 5,070,172, Cl. 528-76.000.

Hirai, Tadaaki: *See*—
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Hirai, Yoshihiko, to NEC Corporation. Active matrix liquid crystal display with series-connected MIM structures as a switching element. 5,069,534, Cl. 359-54.000.

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Hirano, Sadayuki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Continuous speed variable transmission control apparatus. 5,069,083, Cl. 74-844.000.

Hirano, Sadayuki: *See*—
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Hirao, Takashi: *See*—
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Hirasawa, Kiyoshi, to Suzuki Motor company Limited. Seat belt mount mechanism. 5,069,483, Cl. 280-801.000.

Hirata, Hiroharu: *See*—
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Hironori, Yamada, to Teijin Limited. Highly elastic ionic dye-dyeable polyether-ester block copolymer filaments. 5,070,178, Cl. 528-272.000.

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Kuroda, Michio; Kirikami, Seiichi; Hisano, Katsukuni; Iizuka, Nobuyuki; Urushidani, Haruo; Sato, Isao; Ishibashi, Yoji; and Ohmori, Takashi, 5,069,029, Cl. 60-39.060.

Hisano, Shinichi, to Analog Devices, Incorporated. High resolution D/A converter operable with single supply voltage. 5,070,331, Cl. 341-154.000.

Hitachi Automotive Eng Co., Ltd.: *See*—
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Hitachi, Ltd.: *See*—
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Kikawa, Takeshi; Tsuji, Kazutaka; Sameshima, Kenji; Hirai, Tadaaki; Yamazaki, Junichi; Kubota, Misao; and Shidara, Keiichi, 5,070,272, Cl. 313-386.000.
Kubo, Kanji; Yamamoto, Akio; and Takeda, Katsumi, 5,070,444, Cl. 395-425.000.
Kuroda, Michio; Kirikami, Seiichi; Hisano, Katsukuni; Iizuka, Nobuyuki; Urushidani, Haruo; Sato, Isao; Ishibashi, Yoji; and Ohmori, Takashi, 5,069,029, Cl. 60-39.060.
Matsui, Tetsuya; Kitamori, Takehiko; Yokose, Kenji; and Sakagami, Masaharu, 5,070,300, Cl. 324-464.000.
Nagano, Masami; Atago, Takeshi; and Nemoto, Mamoru, 5,069,183, Cl. 123-419.000.
Ogino, Masanori; Yamada, Takeo; and Ikeda, Miyuki, 5,070,281, Cl. 315-370.000.
Okuyama, Nobutaka; Sakurai, Soichi; Kitou, Kouji; Ohsawa, Michitaka; Niitsu, Ichiro; Yoshioka, Hiroshi; Takeyama, Atushi; Obara, Masao; and Yoshimi, Isao, 5,070,280, Cl. 315-368.110.
Ono, Hiroaki; Ozaki, Shinji; and Okada, Shinji, 5,070,424, Cl. 360-108.000.
Sasaki, Hideki; Matsuoka, Shinji; and Yamamoto, Akihiko, 5,069,556, Cl. 400-74.000.
Takano, Makoto; Hoshi, Yasuhiko; Kurakazu, Keiichi; and Baba, Shiro, 5,070,473, Cl. 395-725.000.

Hitachi Maxell, Ltd.: *See*—
Saito, Osamu; and Sumiya, Kenji, 5,069,973, Cl. 428-421.000.
Uetani, Yoshio; Ozeki, Tomotaka; and Ishida, Kazuo, 5,069,989, Cl. 429-164.000.

Hitachi Metals, Ltd.: *See*—
Yoshizawa, Yoshihito; and Yamauchi, Kiyotaka, 5,069,731, Cl. 148-305.000.

Hitachi Microcomputer Engineering Ltd.: *See*—
Takano, Makoto; Hoshi, Yasuhiko; Kurakazu, Keiichi; and Baba, Shiro, 5,070,473, Cl. 395-725.000.

Hitachi Mizusawa Elec. Co Ltd: *See*—
Okuyama, Nobutaka; Sakurai, Soichi; Kitou, Kouji; Ohsawa, Michitaka; Niitsu, Ichiro; Yoshioka, Hiroshi; Takeyama, Atushi; Obara, Masao; and Yoshimi, Isao, 5,070,280, Cl. 315-368.110.

Hitachi Software Engineering Co., Ltd.: *See*—
Fujimiya, Hitoshi; Nakajima, Shigeo; and Nasu, Hisanori, 5,069,769, Cl. 204-182.800.

Hitchcock, George H.: *See*—
Cramer, Gregory D.; Dupre, Roger A.; and Hitchcock, George H., 5,069,552, Cl. 356-440.000.

Hitchiner Corporation: *See*—
Chandley, George D.; and Carter, Richard T., 5,069,271, Cl. 164-516.000.

Hitzman, Donald O., to Geo-Microbial Technologies, Inc. Method and apparatus for removing cyanide from a fluid. 5,069,787, Cl. 210-259.000.

Hladky, Karel; and John, David G., to University of Manchester Institute of Science & Technology. Surface mounting corrosion probe. 5,069,774, Cl. 204-404.000.

Hladky, Vaclav; and Prokes, Jiri, to Form. Rolling machine with quick change working rolls. 5,069,054, Cl. 72-238.000.

Hochmair, Erwin S.: *See*—
Hochmair, Ingeborg J.; and Hochmair, Erwin S., 5,070,535, Cl. 455-41.000.

Hochmair, Ingeborg J.; and Hochmair, Erwin S. Transcutaneous power and signal transmission system and methods for increased signal transmission efficiency. 5,070,535, Cl. 455-41.000.

Hochmuth, Bernd: *See*—
Bendix, Horst; Hochmuth, Bernd; Johannes, Dieter; Lakenmacher, Bodo; Lausch, Winfried; and Schuebel, Klaus, 5,069,891, Cl. 423-359.000.

Hochstrasser, Ferdinand, to KWC AG. Change-over valve with automatic resetting. 5,069,241, Cl. 137-119.000.

Hodate, Masato, to Bridgestone Corporation. Pressure switch. 5,069,759, Cl. 205-73.000.

Hoechst AG: *See*—
Lachhein, Stephen; and Willms, Lothar, 5,070,201, Cl. 544-320.000.

Hoechst Aktiengesellschaft: *See*—
Dietz, Erwin; Sommer, Andreas; Kroh, Adolf; Hohn, Jurgen; Hafner, Otmar; and Rieper, Wolfgang, 5,070,159, Cl. 525-504.000.
Gitzel, Jorg; Macholdt, Hans-Tobias; Sieber, Alexander; Wehowsky, Frank; and Prossel, Gunther, 5,069,994, Cl. 430-110.000.
Schlafer, Ludwig; and Russ, Werner H., 5,070,189, Cl. 534-642.000.
Stahlhofen, Paul, 5,070,001, Cl. 430-281.000.

Hoechst Celanese Corporation: *See*—
Alvarez, Edwardo; DiSano, Lorenzo P.; and Ward, Bennett C., 5,070,153, Cl. 525-420.000.
Auerbach, Andrew, 5,070,127, Cl. 524-262.000.
Chen, Paul N., Sr.; Forschirm, Alex; Glick, Morton; and Jaffe, Michael, 5,070,144, Cl. 525-154.000.

Hoechst Ceramtec Aktiengesellschaft: *See*—
Grote, Dieter; Muller, Fritz; and Pavlicek, Heinz, 5,069,839, Cl. 264-63.000.

Hoechst Roussel Pharmaceuticals Inc.: *See*—
Shutske, Gregory M., 5,070,209, Cl. 549-228.000.

Hofer, Kenneth E.: *See*—
Bridges, Jack E.; Bajzek, Thomas J.; Hofer, Kenneth E.; Spencer, Homer L.; Smith, Larry G.; and Young, Vincent R., 5,070,533, Cl. 392-301.000.

Hofer, Peter; Muller, Ulrich; Barenz, Manfred; Schafer, Horst; and Muller-Lierheim, Wolfgang, to Titmus Eurocon Kontaktlinsen GmbH & Co. KG. Contact lens. 5,069,542, Cl. 351-160.00H.

Hoffman-La Roche Inc.: *See*—
Hsu, Ming Chu, 5,070,010, Cl. 435-6.000.

Hoffman, Ray D.: *See*—
Hicks, Clark T.; Hoffman, Ray D.; and Thompson, James E., II, 5,069,851, Cl. 264-171.000.

Hofmann, Klaus: *See*—
Binder, Rudolf; Schophoff, Friedrich; and Hofmann, Klaus, 5,069,682, Cl. 8-526.000.

Hoge, Carl E.: *See*—
Patterson, Timothy P.; Hoge, Carl E.; and Baia, Joseph, 5,069,626, Cl. 439-55.000.

Hogregfe, Robert; Knox, David J.; and Newman, George E., to Dynatech Electro-Optics Corporation. Method for making microprisms. 5,069,003, Cl. 51-283.00R.

Hohlbein, Douglas J.: *See*—
Vanover, Joel L.; Boyer, Jon F.; Hohlbein, Douglas J.; Montalbano, Anthony P.; Montalbano, Christopher P.; and Van Remoortel, John G., 5,070,351, Cl. 354-299.000.

Hohn, Jurgen: *See*—
Dietz, Erwin; Sommer, Andreas; Kroh, Adolf; Hohn, Jurgen; Hafner, Otmar; and Rieper, Wolfgang, 5,070,159, Cl. 525-504.000.

Holden, Homer N.; Loyer, Philip K.; Noyes, Lowell T.; and Legrady, Janos J., to Dayco Products, Inc. Vacuum cleaner hose construction and method of making the same. 5,069,635, Cl. 439-400.000.

Holland Hitch Company: *See*—
Parr, Timothy J.; and Hungerink, Gerald W., 5,069,472, Cl. 280-433.000.

Holland, Neta, to Ohad Paz. Brush construction including movably-mounted bristles. 5,068,939, Cl. 15-22.100.

Holligan, David: *See*—
Allen, William C.; Pye, Stephen D.; Hamblin, Gerald M.; Perez, Jose M.; Amend, William E.; Bush, John D.; Holligan, David; and Pyle, Delbert E., 5,069,485, Cl. 285-55.000.

Hollingsworth, Richard J.: *See*—
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Hollman, Richard F., to General Signal Corporation. Accumulated exposure detection with exposure terminating attenuator. 5,070,235, Cl. 250-201.100.

Holloway, Robert R.; and Kiang, Teddy T., to Hewlett-Packard Company. Covalently labeled siloxane polymers. 5,070,158, Cl. 525-475.000.

Holman, Thomas H., Jr.; and Lunsford, David R., to Dell USA Corporation. Power on coordination system and method for multiple processors. 5,070,450, Cl. 395-750.000.

Holmberg, Claes: *See*—
Rangert, Bo; Jorneus, Lars; Holmberg, Claes; and Andersson, Matts, 5,069,622, Cl. 433-173.000.

Holmes, John A.; and Korny, Kazimierez J., to Hellberg International Limited. Rigid framed safety goggles having replaceable lens. 5,069,541, Cl. 351-86.000.

Holmes, Paul E.; Roberts, Katherine P.; and August, Christine M., to Olin Corporation. Cleaning composition comprising microbial lipase SD2 and sodium dodecylbenzene sulfonate. 5,069,810, Cl. 252-174.120.

Holmstrom, Roger P.: *See*—
Rideout, William C.; Holmstrom, Roger P.; Eichen, Elliot; Powazinik, William; LaCourse, Joanne; Schlafer, John; and Lauer, Robert B., 5,069,561, Cl. 385-14.000.

Hologic, Inc.: *See*—
Stein, Jay A.; Plewes, Donald B.; Gershman, Russell J.; Liebau, James G.; and Williams, John N., 5,070,519, Cl. 378-146.000.

Holoubek, George H.; and Rhoades, John J., to Courtaulds Packaging Inc. Method of forming a headed thermoplastic tube. 5,069,856, Cl. 264-519.000.

Holter, Spencer C.: *See*—
Block, Timothy R.; Ebler, Marcia B.; Freitag, Ladd W.; Heiling, Gerald M.; Holter, Spencer C.; Karst, Dennis L.; Siljenberg, David W.; Soderstrom, Ronald L.; and Trnka, John T., 5,069,522, Cl. 385-39.000.

Holum, Ronald L.; Brown, Patrick M.; and DeWall, Ronald L., to PRR Industries, Inc. Ice block press. 5,069,044, Cl. 62-320.000.

Homa, Karl L. C.: *See*—
Bacus, Michael W.; Price, Dick T.; Lewis, Dale A.; Demarchi, Michael E.; Homa, Karl L. C.; McInturff, Gary; and Gruell, Robert, 5,070,231, Cl. 219-216.000.

Hon Industries, Inc.: *See*—
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Honda Giken Kogyo K.K.: *See*—
Kato, Akira; Nishikawa, Takafumi; and Masuda, Shun, 5,069,187, Cl. 173-492.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Inoue, Kazuo; Sano, Shoichi; Ogura, Misami; Nagahiro, Kenichi; Konno, Tsuneo; Kajiwara, Hajime; Ono, Yoshinobu; Yoshida, Suguru; Shimada, Hiroo; and Hashiguchi, Masahiro, 5,069,306, Cl. 180-291.000.
Watanabe, Shinpei; Watanabe, Yasuto; Ikeda, Yuzi; Gunji, Keiichiro; and Niikawa, Ryo, 5,069,524, Cl. 385-59.000.

Honda, Naoko; and Nakajima, Tatsuo, to Diesel Kiki Co., Ltd. Magnetic sensor, with sensor gap adjusting high permeable flux collecting chip, for detecting rotation. 5,070,298, Cl. 324-207.200.

Honeywell Inc.: *See*—
Anderson, Bruce M.; and Broderick, Brian E., 5,070,466, Cl. 395-143.000.
Axelson, Eric T.; and Mathews, Thomas P., 5,069,136, Cl. 102-425.000.
Dawson, John F.; Courtright, Glenn M.; and Fischer, Douglas A., 5,070,449, Cl. 395-325.000.
Gilmore, John P.; and Clark, Dereck B., 5,070,458, Cl. 364-424.060.
Martwick, Wilford E., 5,069,137, Cl. 102-434.000.
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Hong, Chen S.: *See*—
Tseng, Jeou N.; Hong, Chen S.; and Wu, Jeng S., 5,069,630, Cl. 439-137.000.

Honnell, Richard E.: *See*—
Petrovic, John J.; Honnell, Richard E.; and Gibbs, W. Scott, 5,069,841, Cl. 264-86.000.

Hoofnagle, Jay H.; Broder, Samuel; Mitsuya, Hiroaki; and Yarchoan, Robert, to United States of America, Health and Human Services. Method of treatment of hepatitis. 5,070,077, Cl. 514-45.000.

Hoover Universal, Inc.: *See*—
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Hopp, Dineen M.: *See*—
Gardner, Robert D.; Hopp, Dineen M.; Shaikh, Aziz S.; and Roberts, Gordon J., 5,070,047, Cl. 501-16.000.

Hopper, Robert J., to Goodyear Tire & Rubber Company, The. Process for the solid state (solventless) hydroxylation of vinyl-containing rubbers using a hydroxymercaptan. 5,070,150, Cl. 525-350.000.

Hopperdietzel, Siegfried, to Rehau AG & Co. Method for laminating a plastic web onto a plastic substrate. 5,069,947, Cl. 428-38.000.

Horace, Martin J. Rope connector having quick engaging and releasing means. 5,068,949, Cl. 24-115.00R.

Hori, Toshio: *See*—
Sakamoto, Yukio; Hori, Toshio; and Fukutani, Iwao, 5,069,641, Cl. 439-620.000.

Horie, Kiyoshi, to Kabushiki Kaisha CSK. Error signal generating circuit. 5,070,491, Cl. 369-44.340.

Horie, Nobuyuki: *See*—
Yamane, Daiji; Horie, Nobuyuki; Taguchi, Aisaku; and Sugiura, Teruki, 5,070,285, Cl. 318-461.000.

Horimai, Hideyoshi: *See*—
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Horinouchi, Shinichi; and Takeuchi, Kunihiko, to Tokyo Keiki Company Ltd. Memory package system utilizing inductive coupling between memory module and read/write unit. 5,070,500, Cl. 370-69.100.

Horneborg, Horst: *See*—
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Hoshi, Kenichi: *See*—
Itami, Yukio; Suzuki, Mitsuo; Ohne, Teruo; Hoshi, Kenichi; Sagae, Eiri; and Hashimoto, Yoshio, 5,069,515, Cl. 359-200.000.

Hoshi, Yasuhiko: *See*—
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Hoshii, Shinji: *See*—
Yasuno, Toshio; Thukagoshi, Toshihiro; Hoshii, Shinji; and Imaizumi, Yasuo, 5,069,089, Cl. 76-107.100.

Hoshikawa, Katsuyuki: *See*—
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Hoshino, Toshihiko: *See*—
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Hot Snacks, Inc.: *See*—
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Hotzer, Georg: *See*—
Burst, Hermann; Gosse, August-Wilhelm; Scadlich, Gunter; and Hotzer. Georg, 5,069,499, Cl. 296-201.000.

Houska, Robert L. Dart shaft extraction tool. 5,068,954, Cl. 29-240.000.

Houston Industries Incorporated: *See*—
Williams, Danny R.; and Barron, Mary A., 5,069,310, Cl. 182-187.000.

Hovland, Heljar; Nilsen, Jan; and Strom, Yngve, to Elkem Technology a/s. Method of flaw detection in billets. 5,069,005, Cl. 51-322.000.

Hoya Corporation: *See*—
Yanagita, Hiroaki; and Okada, Keiko, 5,070,506, Cl. 372-40.000.

Hradcovsky, Rudolf. Method of coating aluminum with vanadium oxides. 5,069,763, Cl. 205-326.000.

Hsiao, Mu-Yue: *See*—
Bossen, Douglas D.; Chen, Chin-Long; and Hsiao, Mu-Yue, 5,070,504, Cl. 371-54.000.

Hsu, Edward C.; and Robbins, John L., to Exxon Research and Engineering Company. Catalyst pretreatment method. 5,070,064, Cl. 502-325.000.

Hsu, Ming Chu, to Hoffman-La Roche Inc. Method for determining anti-viral transactivating activity. 5,070,010, Cl. 435-6.000.

Hsu, Nick. Structure of clip container. 5,069,339, Cl. 206-340.000.
Hsu, Wen-Liang; and Halasa, Adel F., to Goodyear Tire & Rubber Company, The. Segmented elastomer. 5,070,148, Cl. 525-316.000.
Hu, Yung-Haw, to Du Pont de Nemours, E. I., and Company. Dielectric compositions. 5,070,046, Cl. 501-9.000.
Huang, Der-Ray: *See*—
Li, James C. M.; and Huang, Der-Ray, 5,069,428, Cl. 266-104.000.
Huang, Hsu-Nan; Hung, Ming-Hong; and Krespan, Carl G., to Du Pont de Nemours, E. I., and Company. Perfluoro-4,4'-bis(2,2-dimethyl-1,3-dioxolane) and its preparation and use. 5,070,213, Cl. 549-448.000.
Huang, Ing-Chung. Vertically-movable blow molding apparatus. 5,069,611, Cl. 425-90.000.
Hubbard, Edward S.; and Guanella, Terry J., to American Amaranth, Inc. Apparatus and process for expanding raw amaranth. 5,069,923, Cl. 426-445.000.
Huels Aktiengesellschaft: *See*—
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Huet, Jean-Marie: *See*—
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Huffman, Paul F.: *See*—
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Huggins, Raymond W.; and Porter, Charles R., to Boeing Company, The. Multitrack multilevel sensing system with error detecting. 5,069,547, Cl. 356-374.000.
Hughes Aircraft Company: *See*—
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Crumly, William R., 5,069,628, Cl. 439-67.000.
Farwell, William D., 5,070,257, Cl. 307-296.300.
Pastor, Ricardo C.; and Gorre, Luisa E., 5,069,701, Cl. 65-18.200.
Pringle, Richard C., 5,070,336, Cl. 342-151.000.
Wysocki, Joseph A.; and Krajenbrink, Frans G., 5,069,743, Cl. 156-620.700.
Hughes, David L.; Reider, Paul J.; Amato, Joseph S.; Bergan, James J.; and Grabowski, Edward J. J., to Merck & Co., Inc. Enzymic process for preparing leukotriene antagonists. 5,070,022, Cl. 435-280.000.
Hugl, Herbert: *See*—
Fossati, Piero; Heidenreich, Holger; Hugl, Herbert; and Wehling, Klaus, 5,070,198, Cl. 544-182.000.
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Humphreys, Robert W. R.; Harirchian, Bijan; and Smeets, Frans L. M., to Lever Brothers Company. Bleach/builder precursors. 5,069,812, Cl. 252-186.440.
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Huang, Hsu-Nan; Hung, Ming-Hong; and Krespan, Carl G., 5,070,213, Cl. 549-448.000.
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Hunter Automated Machinery Corporation: *See*—
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Hunter, William A., to Hunter Automated Machinery Corporation. Basin former for a matchplate molding machine. 5,069,268, Cl. 164-158.000.
Husky Injection Molding Systems Ltd.: *See*—
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Hussla, Ingo; and Ritter, Jochen, to Leybold Aktiengesellschaft. Method for the evaporation of monomers that are liquid at room temperature. 5,069,930, Cl. 427-55.000.
Huynh, Van L.: *See*—
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Hwa, Chih M.; Kelly, John A.; Neton, Janet; Scanlon, Patricia M.; and Gaudette, Roger R., to W. R. Grace & Co.-Conn. Control of scale in aqueous systems using certain phosphonomethyl amines. 5,069,798, Cl. 210-700.000.
Hwang, Chong S.: *See*—
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Hypertherm, Inc.: *See*—
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Iba, Akio; and Tsutsumi, Kenichi, to Casio Computer Co., Ltd. Musical tone signal generating apparatus with smooth tone color change in response to pitch change command. 5,069,105, Cl. 84-605.000.
Ibiden, Co. Ltd.: *See*—
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Ibuka, Shigehito; Kondo, Hisashi; Sagami, Shigeru; and Sumi, Koji, to Tokyo Electron Limited. Ion implantation device. 5,070,275, Cl. 315-111.810.
IC Sensors Inc.: *See*—
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ICI Americas Inc.: *See*—
Broadhurst, Michael D., 5,070,097, Cl. 514-313.000.
Broadhurst, Michael D.; Cormartie, Thomas H.; Fisher, Karl J.; Haag, William G.; Kanne, David B.; and Leadbetter, Michael R., 5,070,210, Cl. 549-350.000.
ICI Australia Operations Proprietary Limited: *See*—
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IdB Holding SpA: *See*—
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Idemitsu Kosan Company Limited: *See*—
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Tomotsu, Norio; Maezawa, Hiroshi; and Yamamoto, Koji, 5,070,160, Cl. 526-165.000.
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Idemoto, Takahiro: *See*—
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Idowu, Olajire. Egg separator. 5,069,119, Cl. 99-499.000.
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Iijima, Takashi; and Kawashima, Shinji, to Tokyo KiKai Seisakusho, Ltd. Spot printing method in rotary press and blanket cylinder for spot printing. 5,069,127, Cl. 101-415.100.
Iijima, Zenshiro, to Adger Kogyo Co., Ltd. Pressure sensitive reproducing material. 5,070,066, Cl. 503-201.000.
Iino, Tadashi; and Aoki, Kunimitsu, to Yazaki Corporation. Display for vehicle. 5,070,323, Cl. 340-705.000.
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Iizuka, Naonori, to Jatco Corporation. Shift control system for automatic power transmission with enhanced shifting transition characteristics. 5,069,085, Cl. 74-866.000.
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Ikari, Kenji: *See*—
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Ikeda Bussan Co., Ltd.: *See*—
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Seike, Shoji; Mori, Koichi; Ikeda, Mitsuji; Nozaki, Masayuki; Okajima, Hisakazu; Katsukawa, Hiroyuki; Nakanishi, Kazumi; and Doi, Kenji, 5,069,525, Cl. 385-100.000.
Ikeda, Miyuki: *See*—
Ogino, Masanori; Yamada, Takeo; and Ikeda, Miyuki, 5,070,281, Cl. 315-370.000.
Ikeda, Tanejiro: *See*—
Kimura, Tadashi; and Ikeda, Tanejiro, 5,069,746, Cl. 156-633.000.
Ikeda, Tatsuhiko; Sugahara, Kazuyuki; Kusunoki, Shigeru; and Nishioka, Kyusaku, to Mitsubishi Denki Kabushiki Kaisha. Method of making an oxide isolated, lateral bipolar transistor. 5,070,030, Cl. 437-31.000.
Ikeda, Yoshiaki; Kuwasawa, Mitsuru; and Ito, Kenichi, to Fanuc Ltd. Reference point return system. 5,070,288, Cl. 318-618.000.
Ikeda, Yuzi: *See*—
Watanabe, Shinpei; Watanabe, Yasuto; Ikeda, Yuzi; Gunji, Keiichiro; and Niikawa, Ryo, 5,069,524, Cl. 385-59.000.
Ikegami Tsushinki Co., Ltd.: *See*—
Nishida, Yasuaki; Fujita, Yoshihiro; Iino, Yoshiki; and Kawada, Norihiko, 5,069,530, Cl. 359-498.000.
Illien, Mario. Fuel injection assembly for internal combustion engine. 5,069,186, Cl. 123-470.000.
Illinois Tool Works Inc.: *See*—
Ernst, Richard J.; Van Allman, Don T.; Gupta, Harish C.; Dill, Michael C.; and Nilsen, Martin J., 5,069,340, Cl. 206-347.000.
Hasan, Syed R.; Packard, Mark A.; and Ditka, Michael P., 5,069,588, Cl. 411-439.000.
Pliml, Jr., Frank V., 5,069,013, Cl. 52-214.000.
Imai, Mizuho; Sekiguchi, Mikio; Shiba, Nobuyasu; and Iida, Hideyo, to Taiyo Yuden Co., Ltd. Thin film forming apparatus. 5,069,157, Cl. 118-314.000.
Imaizumi, Yasuo: *See*—
Yasuno, Toshio; Thukagoshi, Toshihiro; Hoshii, Shinji; and Imaizumi, Yasuo, 5,069,089, Cl. 76-107.100.

Imhof, Otwin, to Deutsche Automobilgesellschaft mbH. Device for the vibration filling of porous plaques for voltaic cells. 5,069,258, Cl. 141-1.100.

Imo Industries, Inc.: *See—*
Glenn, Brian J., 5,070,220, Cl. 200-81.90M.

Imperial Chemical Industries plc: *See—*
Bradbury, Roy; Gemmell, Peter A.; and Hann, Richard A., 5,070,069, Cl. 503-227.000.
Watts, Arun; Muller, Louis; Verhelst, Gabriel; De Witte, Mireille; Pham, Tu; and Parfondry, Alain, 5,070,114, Cl. 521-159.000.

Imura, Yukihiro, to Seiko Instruments Inc. Passivation layer structure with through-holes for semiconductor device. 5,070,386, Cl. 357-52.000.

Ina, Toshikazu: *See—*
Ishii, Naoki; Ina, Toshikazu; Mori, Koji; Ito, Katsunori; and Asai, Shigenori, 5,070,293, Cl. 320-2.000.

Inaba, Yoshiharu; and Kamiguchi, Masao, to Fanuc Ltd. Crank type mold clamping apparatus with variable stroke. 5,069,613, Cl. 425-150.000.

Inamine, Edward S.: *See—*
Petuch, Brian R.; Chen, Shieh-Shung T.; Inamine, Edward S.; and White, Raymond F., 5,070,015, Cl. 435-42.000.

Inamoto, Kiyoshi: *See—*
Okano, Tokiyuki; Inamoto, Kiyoshi; Ohnishi, Kazuyuki; Nishiyama, Hidetomo; Sohda, Kazunori; Tokishige, Masato; and Shimazawa, Yoichi, 5,070,368, Cl. 355-246.000.

Inax Corporation: *See—*
Fukumoto, Katsuhisa; Kawanishi, Kiyotaka; Nakada, Ryo; and Yamano, Junpei, 5,069,960, Cl. 428-310.500.

Incorvia, Samuel A.: *See—*
Cullen, John S.; and Incorvia, Samuel A., 5,069,694, Cl. 55-318.000.

Industrial Pyrometers (Aust.) Pty. Ltd.: *See—*
Ragless, Clive L., 5,069,726, Cl. 136-201.000.

Industrial Technology Institute: *See—*
Boehnlein, Albert J., 5,069,548, Cl. 356-376.000.
Harding, Kevin G., 5,069,549, Cl. 356-376.000.

Infinitex: *See—*
Thalmann, William H.; and Siegler, Thomas W., 5,069,780, Cl. 210-90.000.

Ingman, Dov, to Select Corporation. Fluid flow meter. 5,069,067, Cl. 73-269.000.

Ingolia, Thomas D.; Kovacevic, Steven; Miller, James R.; and Skatrud, Paul L., to Eli Lilly and Company. Recombinant DNA expression vectors and DNA compounds that encode deacetoxycephalosporin C synthetase. 5,070,020, Cl. 435-183.000.

Inoguchi, Kazuhiko: *See—*
Konushi, Fumihiro; Nakatu, Hiroshi; Inoguchi, Kazuhiko; Okumura, Toshiyuki; Seki, Akinori; Takiguchi, Haruhisa; Nakanishi, Chitose; Sugahara, Satoshi; and Kudo, Hiroaki, 5,070,510, Cl. 372-46.000.

Inoue, Hideya: *See—*
Kazami, Kazuyuki; Daitoku, Koichi; Ezawa, Akira; Ohtsuka, Kazuto; and Inoue, Hideya, 5,070,357, Cl. 354-468.000.

Inoue, Hiroshi: *See—*
Kouzuma, Shinichi; Inoue, Hiroshi; Murata, Kenji; Tanaka, Hiroyuki; and Kishi, Yasuo, 5,069,727, Cl. 136-251.000.

Inoue, Kazuo; Sano, Shoichi; Ogura, Misami; Nagahiro, Kenichi; Konno, Tsuneo; Kajiwara, Hajime; Ono, Yoshinobu; Yoshida, Suguru; Shimada, Hiroo; and Hashiguchi, Masahiro, to Honda Giken Kogyo Kabushiki Kaisha. Mounting structure for the power unit of a motor vehicle. 5,069,306, Cl. 180-291.000.

Inoue, Manabu; Taniguchi, Nobuyuki; Nanba, Katsuyuki; Kudo, Yoshinobu; Iwata, Michihiro; and Wada, Shigeru, to Minolta Camera Kabushiki Kaisha. Camera system capable of recording information in an external memory. 5,070,355, Cl. 354-413.000.

Inoue Seisakusho (Mfg.) Co., Ltd.: *See—*
Kamiwano, Mitsuo; and Inoue, Yoshitaka, 5,069,393, Cl. 241-46.170.

Inoue, Yasuhiro: *See—*
Nakasaki, Eiji; Shirashoji, Hisashi; Hoshikawa, Katsuyuki; Kamijo, Takao; Ikeda, Kazushige; Inoue, Yasuhiro; and Kato, Takeo, 5,069,262, Cl. 152-536.000.

Inoue, Yoshitaka: *See—*
Kamiwano, Mitsuo; and Inoue, Yoshitaka, 5,069,393, Cl. 241-46.170.

Inpro Companies, Inc.: *See—*
Orlowski, David C., 5,069,461, Cl. 277-25.000.

Institut Elekctrosvarki Imeni E. O. Patona Akademii Nauk Ukrainskoi SSR: *See—*
Paton, Boris E.; Podgaetsky, Vladimir V.; Varenchuk, Pavel A.; Privalov, Nikolai T.; Galinich, Vladimir I.; Kovalev, Valentin D.; and Romanenko, Yaroslav A., 5,070,225, Cl. 219-73.000.

Institut Pasteur: *See—*
Crepin, Michel, 5,070,009, Cl. 435-6.000.

Instrumentarium Corporation: *See—*
Rantala, Borje T.; and Weckstrom, Kurt P., 5,070,245, Cl. 250-343.000.

Insul-Lite Window Manufacturing, Inc.: *See—*
Makarowski, Anthony, 5,069,001, Cl. 49-176.000.

Inter Therapy, Inc.: *See—*
Guess, Joe F.; and Zalesky, Paul J., 5,069,664, Cl. 604-22.000.

International Business Machines: *See—*
Bossen, Douglas D.; Chen, Chin-Long; and Hsiao, Mu-Yue, 5,070,504, Cl. 371-54.000.

International Business Machines Coproration: *See—*
Crandall, Donald R., 5,070,448, Cl. 395-575.000.

International Business Machines Corporation: *See—*
Bletscher, Warren L., Jr.; Lewkowicz, Julian; and Tayefeh, Morovat, 5,070,495, Cl. 369-116.000.
Block, Timothy R.; Ebler, Marcia B.; Freitag, Ladd W.; Heiling, Gerald M.; Holter, Spencer C.; Karst, Dennis L.; Siljenberg, David W.; Soderstrom, Ronald L.; and Trnka, John T., 5,069,522, Cl. 385-39.000.
Dao-Trong, Son; Getzlaff, Klaus J.; and Helwig, Klaus, 5,070,471, Cl. 364-760.000.
Garneau, Denis; and Sears, Wen-Hsiu, 5,070,456, Cl. 364-419.000.
Lascelles, Martin C.; and Wong, Michael, 5,070,534, Cl. 395-155.000.
Scully, Keith J.; and Singh, Harinder S., 5,070,470, Cl. 364-705.080.

International Flavors & Fragrances Inc.: *See—*
Buckholz, Lawrence L.; Sudol, Marion A.; and Byrne, Brian, 5,069,916, Cl. 426-243.000.
Narula, Anubhav P. S.; De Virgilio, John J.; Benaim, Carlos; Ouwerkerk, Anton V.; and Gillotin, Olivier, 5,070,073, Cl. 512-13.000.
Rutherford, Howard J., 5,069,231, Cl. 131-335.000.

International Fuel Cells Corporation: *See—*
Cohen, Ronald; and Hall, Eugene W., 5,069,985, Cl. 429-26.000.

International Paper Company: *See—*
Beales, Jonathan T., 5,069,335, Cl. 206-144.000.

International Sports Technology, Inc.: *See—*
Bellagamba, Miro D., 5,069,456, Cl. 273-183.00E.

Int'l Environmental Systems, Inc.: *See—*
Wang, Lawrence K.; Wang, Mu H. S.; Hwang, Chong S.; and Rhow, Harold, 5,069,783, Cl. 210-196.000.

Inujima, Takashi: *See—*
Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, 5,069,531, Cl. 359-55.000.

Inukai, Hiroshi: *See—*
Ohmori, Akira; Inukai, Hiroshi; Kitahara, Takahiro; and Ueda, Akihiko, 5,069,941, Cl. 427-385.500.

Inumochi, Mitsuo, to Mitsubishi Denki Kabushiki Kaisha. Surface structure of a magnetic disk. 5,070,425, Cl. 360-135.000.

Inventions, Inc.: *See—*
Szlam, Aleksander; Crooks, James W., Jr.; and Warner, Charles L., II, 5,070,525, Cl. 379-196.000.

Invernizzi, Renzo: *See—*
Masi, Francesco; Moalli, Angelo; Invernizzi, Renzo; Menconi, Francesco; Ferrero, Cesare; Malquori, Stefano; Barazzoni, Lia; and Polesello, Mario, 5,070,051, Cl. 502-9.000.

Iowa State University Research Foundation, Inc.: *See—*
Brown, Robert C., 5,069,551, Cl. 356-432.000.
McClelland, John F.; and Jones, Roger W., 5,070,242, Cl. 250-339.000.

Irwin, Christopher, to Hoover Universal, Inc. Plastic container with tear opening feature. 5,069,345, Cl. 220-270.000.

Isayev, Avraam I.; and Subramania, Pazampalaco R., to University of Akron. Self reinforced composite of thermotropic liquid crystal polymers. 5,070,157, Cl. 525-444.000.

Ise, Satoshi, to Casio Computer Co., Ltd. Image forming apparatus with improved operation panel operability. 5,069,439, Cl. 271-163.000.

Iseda, Atsuro; and Sawaragi, Yoshiatsu, to Sumitomo Metal Industries, Ltd. High-strength high-CR steel with excellent toughness and oxidation resistance. 5,069,870, Cl. 420-70.000.

Ishibashi, Yoji: *See—*
Kuroda, Michio; Kirikami, Seiichi; Hisano, Katsukuni; Iizuka, Nobuyuki; Urushidani, Haruo; Sato, Isao; Ishibashi, Yoji; and Ohmori, Takashi, 5,069,029, Cl. 60-39.060.

Ishida, Kazuo: *See—*
Uetani, Yoshio; Ozeki, Tomotaka; and Ishida, Kazuo, 5,069,989, Cl. 429-164.000.

Ishiguro, Michihiro: *See—*
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 5,070,172, Cl. 528-76.000.

Ishihara, Yukihiro; Yamamoto, Tamotsu; and Matsui, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Rotary encoder having circular magnet. 5,070,238, Cl. 250-231.130.

Ishii, Masao: *See—*
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 5,070,172, Cl. 528-76.000.

Ishii, Mitoshi. Method of operating press machine and servo controller therefor. 5,069,060, Cl. 72-443.000.

Ishii, Naoki; Ina, Toshikazu; Mori, Koji; Ito, Katsunori; and Asai, Shigenori, to Nippon Soken, Inc.; and Nippondenso Co., Ltd. Electric power transmitting device with inductive coupling. 5,070,293, Cl. 320-2.000.

Ishii, Noriyuki; Hirano, Masayasu; Kajita, Hideo; Kuroda, Hirokazu; Izumi, Shuji; Fujino, Akihiko; Ishimura, Toshihiko; and Seki, Reiji, to Minolta Camera Kabushiki Kaisha. Connecting device for IC card. 5,070,234, Cl. 235-441.000.

Ishii, Yoshiki; Shimokoriyama, Makoto; Shimizu, Tetsuya; Yoshimura, Katsuji; Fujii, Akio; and Sasatani, Tomohiko, to Canon Kabushiki Kaisha. Encoding image information transmission apparatus. 5,070,402, Cl. 358-135.000.

Ishikawa, Akira: *See—*
Yanai, Hidetoshi; and Ishikawa, Akira, 5,069,963, Cl. 428-323.000.

Ishikawa, Kiichirou; Fukumoto, Yasuhiro; and Dudek, Chet, to Yoshida Kogyo K. K. Trouser-fly piece serging apparatus. 5,069,148, Cl. 112-104.000.

Ishikawa, Michio: *See*—
Nakamura, Kyuzo; Ota, Yoshifumi; Ishikawa, Michio; Tani, Noriaki; Hashimoto, Masanori; and Murata, Yuzo, 5,069,983, Cl. 428-694.000.

Ishikawa, Yasushi, to Seikosha Co., Ltd. Duplex printing apparatus. 5,069,437, Cl. 271-3.100.

Ishikawa, Yujiro: *See*—
Kuzuya, Susumu; Shimizu, Seiji; Kato, Mikio; Ishikawa, Yujiro; Sakai, Takashi; and Yuki, Eiji, 5,069,557, Cl. 400-120.000.

Ishimaru, Kiichiro: *See*—
Mori, Masami; Yanagishita, Norio; Matsuura, Ichiro; Ishimaru, Kiichiro; and Mizuno, Hisayoshi, 5,069,838, Cl. 264-46.600.

Ishimura, Toshihiko: *See*—
Ishii, Noriyuki; Hirano, Masayasu; Kajita, Hideo; Kuroda, Hirokazu; Izumi, Shuji; Fujino, Akihiko; Ishimura, Toshihiko; and Seki, Reiji, 5,070,234, Cl. 235-441.000.

Ishino, Tsutomu; and Maruyama, Ryoichi, to Kabushiki Kaisha Komatsu Seisakusho. Clutch changeover circuit for non-stage transmission. 5,069,087, Cl. 74-867.000.

Ishizu, Akira: *See*—
Ohuchida, Hirofumi; Gofuku, Eishi; Takasago, Hayato; Ishizu, Akira; Tobita, Toshio; and Takada, Mitsuyuki, 5,069,745, Cl. 156-630.000.

Isnardi, Michael A.; and Fuhrer, Jack S., to General Electric Company. Compatible widescreen television system. 5,070,396, Cl. 358-12.000.

Isobe, Ken-ichi: *See*—
Tsumura, Hiroshi; Mutoh, Kiyoyuki; Satoh, Kazushi; and Isobe, Ken-ichi, 5,070,175, Cl. 528-12.000.

Isover Saint-Gobain: *See*—
Kaufmann, Friedrich; Schlossherr, Horst-Werner; and Zinn, Egon, 5,069,122, Cl. 101-9.000.

Isozaki, Kiyoshi: *See*—
Kimura, Akira; Kitao, Nobuo; Yasuda, Hiroshi; Shimomura, Yoshimasa; Isozaki, Kiyoshi; and Nishimura, Hiroshi, 5,069,486, Cl. 285-166.000.

ISTAR, Inc.: *See*—
Wortman, Andrew, 5,069,402, Cl. 244-130.000.

Isuzu Ceramics Research Institute Co., Ltd.: *See*—
Kawamura, Hideo, 5,069,422, Cl. 251-129.100.

Isuzu Motors Limited: *See*—
Kawamura, Hideo, 5,069,178, Cl. 123-256.000.

Italimpianti of America, Inc.: *See*—
Rey, Giorgio A., 5,069,158, Cl. 118-410.000.

Itami, Yukio; Suzuki, Mitsuo; Ohne, Teruo; Hoshi, Kenichi; Sagae, Eiri; and Hashimoto, Yoshio, to Ricoh Company, Ltd. Optical deflector of air bearing type. 5,069,515, Cl. 359-200.000.

Ito, Haruyuki; and Matsumoto, Akio, to Toto Ltd. Mold used in pressure casting ceramic articles. 5,069,609, Cl. 425-84.000.

Ito, Kanji; and Kakuta, Mitsuhiro, to Seikosha Co., Ltd. Exposure control unit for a motor-driven shutter. 5,070,354, Cl. 354-412.000.

Ito, Katsuhiro: *See*—
Yoshimoto, Hataaki; and Ito, Katsuhiro, 5,070,326, Cl. 340-719.000.

Ito, Katsunori: *See*—
Ishii, Naoki; Ina, Toshikazu; Mori, Koji; Ito, Katsunori; and Asai, Shigenori, 5,070,293, Cl. 320-2.000.

Ito, Kazuhisa: *See*—
Higuchi, Yoshiharu; and Ito, Kazuhisa, 5,069,149, Cl. 112-277.000.

Ito, Kenchi: *See*—
Fukushima, Atsuko; Hira, Yasuo; Sato, Hidemi; Kawamoto, Kazumi; Ito, Kenchi; Shiba, Masataka; and Arimoto, Akira, 5,070,488, Cl. 360-44.120.

Ito, Kenichi: *See*—
Ikeda, Yoshiaki; Kuwasawa, Mitsuru; and Ito, Kenichi, 5,070,288, Cl. 318-618.000.

Ito, Masazumi; and Utsunomiya, Yoichi, to Minolta Camera Kabushiki Kaisha. Counting system for use in a copying machine. 5,070,363, Cl. 355-206.000.

Ito, Osamu; and Mizutani, Hiroshi, to Kao Corporation. Sanitary article. 5,069,676, Cl. 604-358.000.

Ito, Osamu: *See*—
Ogawa, Masaharu; Nakajima, Yoshiki; Ito, Osamu; Furukawa, Teruo; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Ototake, Masafumi; and Ozaki, Minoru, 5,070,492, Cl. 369-47.000.

Ito, Yuichi: *See*—
Izumi, Tomoji; Fujita, Nagahisa; and Ito, Yuichi, 5,070,258, Cl. 307-303.000.

Itoh Seiyu Kabushiki Kaisha: *See*—
Aoki, Akira; Fujishima, Yukio; Makio, Yusuke; Kusakawa, Susumu; Tsuji, Sadaaki; and Okamura, Tadashi, 5,069,815, Cl. 252-301.360.

Itoh, Tsutomu: *See*—
Yoshikawa, Masanori; Tateno, Haruo; Obana, Hiroshi; Itoh, Tsutomu; Saitoh, Hiroshi; and Kitoh, Masayuki, 5,070,274, Cl. 315-111.210.

Itoh, Yasunaga: *See*—
Namba, Keizo; Itoh, Yasunaga; and Nakanishi, Hiroshi, 5,069,980, Cl. 428-654.000.

ITT Corporation: *See*—
Dennany, Robert, Jr.; and Randall, Ken, 5,069,424, Cl. 251-149.600.
Gibbs, Glen A.; and Johnson, Arnold T., 5,069,381, Cl. 228-132.000.

Iversen, Ernst W. Air flow directing device. 5,069,025, Cl. 56-295.000.

Iwahashi, Naoto; Akagiri, Kenzo; and Setoguchi, Hiromi, to Sony Corporation. Method and apparatus for processing digital signal. 5,070,515, Cl. 375-27.000.

Iwai, Shougo: *See*—
Tamagaki, Akira; and Iwai, Shougo, 5,070,360, Cl. 355-40.000.

Iwama, Masatoshi: *See*—
Okuyama, Takashi; and Iwama, Masatoshi, 5,070,237, Cl. 250-227.310.

Iwanami, Teruo: *See*—
Tse, Samuel W.; Schroeder, George O.; and Iwanami, Teruo, 5,069,955, Cl. 428-213.000.

Iwasa, Masao; and Mori, Masayuki, to Otis Elevator Company. Alternating current motor control system with emergency control responsive to failure of power supply. 5,070,290, Cl. 318-758.000.

Iwasa, Masao; and Kito, Yasutami, to Otis Elevator Company. Clipper circuit for power transistor circuit and inverter circuit utilizing the same. 5,070,426, Cl. 361-91.000.

Iwasaki, Tameo; and Takashima, Kohki, to Tanabe Seiyaku Co., Ltd. Naphthalene derivatives and composition and methods of use, and aldehyde intermediates. 5,070,103, Cl. 514-463.000.

Iwasawa, Naozumi: *See*—
Seko, Kenji; Akaki, Yuu; Iwasawa, Naozumi; and Kondo, Toshio, 5,070,000, Cl. 430-280.000.

Iwase, Shinichi: *See*—
Nakajima, Takashi; Yugi, Akira; and Iwase, Shinichi, 5,069,979, Cl. 428-644.000.

Iwata, Hiroo; Miyaki, Yoshiyuki; and Nakamura, Hiroaki, to Tosoh Corporation. Method for modifying the surface of a polymer article. 5,069,926, Cl. 427-40.000.

Iwata, Michihiro: *See*—
Inoue, Manabu; Taniguchi, Nobuyuki; Nanba, Katsuyuki; Kudo, Yoshinobu; Iwata, Michihiro; and Wada, Shigeru, 5,070,355, Cl. 354-413.000.

Izumi, Shuji: *See*—
Ishii, Noriyuki; Hirano, Masayasu; Kajita, Hideo; Kuroda, Hirokazu; Izumi, Shuji; Fujino, Akihiko; Ishimura, Toshihiko; and Seki, Reiji, 5,070,234, Cl. 235-441.000.

Izumi, Tomoji; Fujita, Nagahisa; and Ito, Yuichi, to Mazda Motor Corporation. Integrated circuit having metal substrate used to provide electrical indication of operation mode of circuits. 5,070,258, Cl. 307-303.000.

J. M. Voith GmbH: *See*—
Muller, Wolfgang, 5,068,980, Cl. 34-117.000.

J. Uriach & Cia. S.A.: *See*—
Bartroli, Javier; Anquita, Manuel; and Carceller, Elena, 5,070,139, Cl. 549-221.000.

Jachec, Kevin: *See*—
Pucci, Mark S.; Shida, Mitsu; Machonis, John, Jr.; and Jachec, Kevin, 5,070,143, Cl. 525-74.000.

Jack, Michael D., to Santa Barbara Research Center. Resonant frequency modulation detector. 5,070,241, Cl. 250-336.200.

Jackson, Clifford. Fiber-free knife for hydraulic vegetable cutting system. 5,069,100, Cl. 83-857.000.

Jacob, Allan S.; and Zawadzki, Andrzej, to Heath Consultants Incorporated. Fluid level maintenance sensor for use in a tank test system. 5,069,068, Cl. 73-313.000.

Jacob, Richard J., to 333 Products, Inc. Picture hanger. 5,069,412, Cl. 248-493.000.

Jacobson Mfg. Co., Inc.: *See*—
Baubles, Richard C., 5,069,637, Cl. 439-412.000.

Jadvar, Hossein; and Metzger, William T., to Arzco Medical Electronics, Inc. Multiple electrode affixable sheet. 5,069,215, Cl. 128-642.000.

Jaffe, Michael: *See*—
Chen, Paul N., Sr.; Forschirra, Alex; Glick, Morton; and Jaffe, Michael, 5,070,144, Cl. 525-154.000.

Jagdmann, Gunnar E., Jr.; and Munson, Harry R., Jr., to A. H. Robins Company, Incorporated. Substituted 4-(amidino)benzamides of 1-azabicyclo[2.2.2]octan-3- and -4-amine as gastric prokinetic, antiemetic, and anxiolytic agents. 5,070,095, Cl. 514-305.000.

Jamerson, Randy: *See*—
Moyher, George C., Jr.; Jamerson, Randy; Nessim, David; Kapec, Jeffrey; Tanaka, Kazuna; and Chochinov, Allan, 5,069,782, Cl. 210-192.000.

James, Simon M.; Downing, Roland W.; and Drouet, Dominik, to British Telecommunications public limited company. Optical fibre handling apparatus and method of using same. 5,069,519, Cl. 385-32.000.

Janczak, Christian; and Schopp, Richard, to Teldix GmbH. Electromechanical device for stopping a shaft in at least one position. 5,070,266, Cl. 310-77.000.

Janssen Pharmaceutica N.V.: *See*—
Stokbroekx, Raymond A.; and Van der Aa, Marcel J. M., 5,070,090, Cl. 514-236.500.

Japan Aviation Electronics Industry Limited: *See*—
Sasaki, Hiroyuki, 5,069,518, Cl. 385-43.000.

Japan Sewage Works Agency: *See*—
Taniguchi, Naohiro; Koike, Syuzo; Watanabe, Yasuhiko; Takeuchi, Tadao; and Fujiwara, Noboru, 5,069,784, Cl. 210-205.000.

Japan Storage Battery Co., Ltd.: *See*—
Yoshimura, Koji; and Yasuda, Hideo, 5,069,990, Cl. 429-206.000.

Jarvis, Wilbur W.: *See*—
Dingler, Geoffrey L.; and Jarvis, Wilbur W., 5,069,360, Cl. 220-501.000.

Jasinaki, Leon, to Motorola, Inc. On-site communication system with RF shielding having pager identification capability. 5,070,329, Cl. 340-825.440.

Jatco Corporation: *See*—
Iizuka, Naonori, 5,069,085, Cl. 74-866.000.

Jean Walterscheid GmbH: *See*—
Mikeska, Felix, 5,069,574, Cl. 403-274.000.
Jeffway, Robert W., Jr.; and Dobosz, Catherine R., to Western Publishing Company, Inc. Crayon caddy. 5,069,361, Cl. 221-82.000.
Jen, Kway-Yue A.; and Elsenbaumer, Ronald L., to Allied-Signal Inc. Thermally stable forms of electrically conductive polyaniline. 5,069,820, Cl. 252-500.000.
Jenne, James F., to Grosh Scenic Studios, Inc. Portable acoustical panel structure. 5,069,011, Cl. 52-144.000.
Jennings, Albert L., to Economy Forms Corporation. Device for leveling concrete form assemblies. 5,069,418, Cl. 249-210.000.
Jensen, Charles A. Method of treating spastic colitis. 5,069,912, Cl. 424-630.000.
Jensen-Korte, Uta: *See*—
Fischer, Reiner; Jensen-Korte, Uta; Kunisch, Franz; Marhold, Albrecht; Ooms, Pieter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,069,711, Cl. 71-92.000.
Jensen, Millard J.: *See*—
Levine, Jules D.; and Jensen, Millard J., 5,069,740, Cl. 156-616.200.
Jepmar Research: *See*—
Rampe, John F., 5,069,654, Cl. 474-161.000.
Jerman, John H., to IC Sensors Inc. Semiconductor microactuator. 5,069,419, Cl. 251-11.000.
Jerome, Denis: *See*—
Penven, Paul; Michel, Philippe; Jerome, Denis; and Moradpour, Alexandre, 5,070,214, Cl. 556-64.000.
Jeutter, Dean C.; Josse, Fabien J.; and Han, James C. Cochlear implant employing frequency-division multiplexing and frequency modulation. 5,069,210, Cl. 128-420.600.
Ji, Bryan. Coin holding device. 5,069,261, Cl. 150-150.000.
Jidosha Denki Kogyo K.K.: *See*—
Sekine, Shuji; Furuya, Takeo; and Obara, Tetsuya, 5,069,502, Cl. 296-223.000.
Jidosha Kiki Co., Ltd.: *See*—
Emori, Yasuyoshi; and Ninamibata, Yukimitsu, 5,069,250, Cl. 137-625.230.
Kojima, Takao; and Minamibata, Yukimitsu, 5,069,425, Cl. 251-359.000.
Jin, Dae-Je, to SamSung Electronics Co., Ltd. Method of forming low-resistive contact to N+/P+ preohmic regions in very large scale integrated devices. 5,070,038, Cl. 437-200.000.
Joergensen, Klaus, to Novo Industri A/S. Magnesium containing insulin solution. 5,070,186, Cl. 530-304.000.
Johannes, Dieter: *See*—
Bendix, Horst; Hochmuth, Bernd; Johannes, Dieter; Lakenmacher, Bodo; Lausch, Winfried; and Schuebel, Klaus, 5,069,891, Cl. 423-359.000.
Johansson, Eric B., to General Electric Company. Nuclear fuel assembly spacer and spring. 5,069,864, Cl. 376-441.000.
Johansson, Sven-Eric; Melhus, Ulf; and Selin, Lennart, to Aktiebolaget Bofors. Ignition system. 5,069,135, Cl. 102-380.000.
Johenning, John B., to Strata Flotation, Inc. Waterbed mattress with hexagonal polypropylene baffle structures. 5,068,934, Cl. 5-450.000.
John D. Brush & Co., Inc.: *See*—
Avery, Roland M., Jr., 5,069,358, Cl. 220-426.000.
John, David G.: *See*—
Hladky, Karel; and John, David G., 5,069,774, Cl. 204-404.000.
Johns Hopkins University, The: *See*—
Earnshaw, William C.; and D'Arpa, Peter, 5,070,192, Cl. 536-27.000.
Johnson, Arnold T.: *See*—
Gibbs, Glen A.; and Johnson, Arnold T., 5,069,381, Cl. 228-132.000.
Johnson, David A. Electrical interconnect contact system. 5,069,629, Cl. 439-71.000.
Johnson, Mark L.; and Oertley, Thomas E., to Caterpillar Inc. Endless track chain with rotatable sleeve. 5,069,509, Cl. 305-58.0PC.
Johnson Matthey Public Limited Company: *See*—
Shutt, Eric, 5,070,063, Cl. 502-230.000.
Johnson, Richard E.; Davis, Dennis D.; Kee, David R.; Orcutt, John W.; and Hightower, Angus W., to Texas Instruments Incorporated. Method of making an integrated circuit using a pre-served dam bar to reduce mold flash and to facilitate flash removal. 5,070,039, Cl. 437-207.000.
Johnson, Richard J. Push-pull rake. 5,069,026, Cl. 56-400.110.
Johnson, Steven M.: *See*—
Leech, Edward J.; and Johnson, Steven M., 5,070,002, Cl. 430-325.000.
Johnston, Thomas F., Jr.; and Dewey, David A., to Coherent, Inc. Apparatus for measuring the mode quality of a laser beam. 5,069,527, Cl. 359-823.000.
Jolicoeur, Carmel: *See*—
Haase, Dieter; Spiratos, Nelu; and Jolicoeur, Carmel, 5,069,893, Cl. 423-556.000.
Jones, Elaine V.; Mellencamp, Mark W.; and Miller, Timothy J. Preparation of a recombinant subunit vaccine against pseudorabies infection. 5,069,901, Cl. 424-89.000.
Jones, Frank T. Canine bullet-proof vest. 5,068,921, Cl. 2-2.500.
Jones, Franklin B.: *See*—
Milberger, Walter E.; Kerfoot, Charles S.; and Jones, Franklin B., 5,070,538, Cl. 455-126.000.
Jones, Larren F., to Esco Corporation. Excavating tooth point particularly suited for large dragline buckets. 5,068,986, Cl. 37-142.00A.
Jones, Michael D.: *See*—
Kulesha, Richard L.; Jones, Michael D.; and Schmitt, Thomas E., 5,069,318, Cl. 188-377.000.
Jones, Roger W.: *See*—
McClelland, John F.; and Jones, Roger W., 5,070,242, Cl. 250-339.000.
Jones, William R., Jr., to Columbian Chemicals Company. Carbon black reactor with a choke extension. 5,069,882, Cl. 422-150.000.
Jorneus, Lars: *See*—
Rangert, Bo; Jorneus, Lars; Holmberg, Claes; and Andersson, Matts, 5,069,622, Cl. 433-173.000.
Josephson, Lee: *See*—
Groman, Ernest V.; Josephson, Lee; and Lewis, Jerome M., 5,069,216, Cl. 128-653.400.
Joshi, David P.; Ramachandran, P.; and Soriano, Zenaida B., to Colgate-Palmolive Company. Detergent laundry bar with improved formulation and process. 5,069,825, Cl. 252-533.000.
Josse, Fabien J.: *See*—
Jeutter, Dean C.; Josse, Fabien J.; and Han, James C., 5,069,210, Cl. 128-420.600.
Jourdain, Gerard E. A.; and Loubet, Marc G., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.". Heat protective lining for an afterburner or transition duct of a turbojet engine. 5,069,034, Cl. 60-261.000.
JS Telecom: *See*—
Le Comte, Michel L., 5,070,516, Cl. 375-102.000.
Judge, Fraderick D.: *See*—
Chin, James; Marshall, James B.; Drozdick, Michael D.; Rosa, Fred C.; and Judge, Fraderick D., 5,070,197, Cl. 544-11.000.
Jung, In Soo. Self-ventilating device for a shoe insole. 5,068,981, Cl. 36-3.00R.
Jurgens, Eberhard: *See*—
Wagner, Joachim; Elsner, Thomas; Rasshofer, Werner; Faehndrich, Jurgen; and Jurgens, Eberhard, 5,069,857, Cl. 264-544.000.
Kabushiki Kaisha CSK: *See*—
Horie, Kiyoshi, 5,070,491, Cl. 369-44.340.
Kabushiki Kaisha Daiken Seisakusho: *See*—
Takeuchi, Hiroshi; and Masaki, Michitomo, 5,069,323, Cl. 192-110.00B.
Kabushiki Kaisha Daikin Seisakusho: *See*—
Mizukami, Hiroshi; and Fukutake, Heiji, 5,069,322, Cl. 192-70.250.
Kabushiki Kaisha Fujikoshi: *See*—
Okumura, Toshikata; Nakamura, Yukio; Yoneoka, Noriei; and Hachikawa, yuiti, 5,069,832, Cl. 264-23.000.
Yokoi, Hidetoshi; Okumura, Toshikato; Nakamura, Yukio; Yoneoka, Noriei; and Hachikawa, Syuiti, 5,069,833, Cl. 264-23.000.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Katsuta, Masanori, 5,070,218, Cl. 200-5.00A.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Ishino, Tsutomu; and Maruyama, Ryoichi, 5,069,087, Cl. 74-867.000.
Kabushiki Kaisha Sato: *See*—
Matsuda, Yasuhiko, 5,069,562, Cl. 400-120.000.
Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Koide, Teruhiko; Buma, Kozi; Ogasawara, Takashi; and Shinto, Hiroaki, 5,069,479, Cl. 280-734.000.
Kabushiki Kaisha Toshiba: *See*—
Mano, Hiroshi, 5,070,524, Cl. 379-165.000.
Miyazaki, Shinji; and Tsunashima, Yoshitaka, 5,069,244, Cl. 137-209.000.
Todome, Tuyoshi, 5,070,467, Cl. 395-166.000.
Tsutsumi, Teruo, 5,070,414, Cl. 358-466.000.
Kaczorowski, Damian: *See*—
Kohy, Lowell I.; and Kaczorowski, Damian, 5,069,516, Cl. 350-96.100.
Kageyama, Fumio, to Mazda Motor Corporation. Vehicle having slip suppressing device and suspension control device. 5,069,302, Cl. 180-197.000.
Kagstrom, Leif S.: *See*—
Gladh, Olov H.; and Kagstrom, Leif S., 5,070,313, Cl. 333-202.000.
Kaiser, Jeffrey L.; Wright, David L.; Hegedus, Denes A.; and Peterson, Alan B., to Spectra-Physics, Inc. Interference fit laser disk. 5,070,512, Cl. 372-65.000.
Kajita, Hideo: *See*—
Ishii, Noriyuki; Hirano, Masayasu; Kajita, Hideo; Kuroda, Hirokazu; Izumi, Shuji; Fujino, Akihiko; Ishimura, Toshihiko; and Seki, Reiji, 5,070,234, Cl. 235-441.000.
Kajiwara, Hajime: *See*—
Inoue, Kazuo; Sano, Shoichi; Ogura, Misami; Nagahiro, Kenichi; Konno, Tsuneo; Kajiwara, Hajime; Ono, Yoshinobu; Yoshida, Suguru; Shimada, Hiroo; and Hashiguchi, Masahiro, 5,069,306, Cl. 180-291.000.
Kakimoto, Toshihiko; and Murakami, Takuya, to Nissan Motor Company, Limited. Bush assembly. 5,069,431, Cl. 267-141.000.
Kakino, Shigeru; Nakamura, Tatsushi; Tamari, Toshinori; and Takahashi, Masao, to Nippon Oil and Fats Company, Limited. Water-in-oil type emulsion explosive envelope. 5,069,132, Cl. 102-331.000.
Kakiuchi, Hideaki: *See*—
Waketa, Hideharu; Suzuki, Yoshiharu; Murakoshi, Motoharu; Kakiuchi, Hideaki; Ohgushi, Masuhito; Watanabe, Kenichi; and Sawai, Toshiya, 5,069,971, Cl. 428-391.000.
Kako, Hajime, to Mitsubishi Denki Kabushiki Kaisha. Ignition timing control apparatus for an engine. 5,069,182, Cl. 123-418.000.
Kako, Mitsumasa; Morita, Toshiki; and Wakita, Motoji, to Brother Kogyo Kabushiki Kaisha. Printing system. 5,069,564, Cl. 400-605.000.
Kakuma, Satoshi; Takahashi, Atsuhisa; and Uchida, Yoshihiro, to Fujitsu Limited. Call control system in ATM switch. 5,070,498, Cl. 370-60.000.

Kakuta, Mitsuhiro: *See*—
Ito, Kanji; and Kakuta, Mitsuhiro, 5,070,354, Cl. 354-412.000.

Kale, Vasant D.: *See*—
Callaghan, Thomas M.; Pasta, Vallabhdas M.; Kale, Vasant D.; and Bruce, Charles A., 5,069,822, Cl. 252-511.000.

Kali-Chemie AG: *See*—
Gerling, Klaus-Guenter; and Wilke, Detlef, 5,069,808, Cl. 252-99.000.

Kaller, Roy S.; and Thomas, David M., to Burr-Brown Corporation. Two-step subranging analog to digital converter. 5,070,332, Cl. 341-156.000.

Kameyama, Yutaka: *See*—
Sasaoka, Michio; Saito, Nori; Shiroi, Takashi; Nagao, Shigemitsu; Kikuchi, Ryo; and Kameyama, Yutaka, 5,070,194, Cl. 540-214.000.

Kamiguchi, Masao: *See*—
Inaba, Yoshiharu; and Kamiguchi, Masao, 5,069,613, Cl. 425-150.000.

Kamijo, Takao: *See*—
Nakasaki, Eiji; Shirashoji, Hisashi; Hoshikawa, Katsuyuki; Kamijo, Takao; Ikeda, Kazushige; Inoue, Yasuhiro; and Kato, Takeo, 5,069,262, Cl. 152-536.000.

Kaminski, Ram, to Mount Sinai School of Medicine of the City University of New York. Method and pharmaceutical composition for the treatment of schizophrenia. 5,070,101, Cl. 514-399.000.

Kamishiro, Toshiro: *See*—
Masaki, Mitsuo; Satoh, Masaru; Moritoh, Naoya; Hashimoto, Koichi; Kamishiro, Toshiro; and Shinozaki, Haruhiko, 5,070,196, Cl. 540-450.000.

Kamiwano, Mitsuo; and Inoue, Yoshitaka, to Inoue Seisakusho (Mfg.) Co., Ltd. Dispersing and grinding apparatus. 5,069,393, Cl. 241-46.170.

Kamyr AB: *See*—
Richter, Johan C. F. C., 5,069,752, Cl. 162-37.000.

Kamyr, Inc.: *See*—
Chamblee, Wayne J.; and Greenwood, Brian F., 5,069,751, Cl. 162-5.000.

Kanda, Yutaka; Uosaki, Youichi; Saito, Hiromitsu; Sano, Hiroshi; Kobayashi, Eiji; Morimoto, Makoto; and Nagamura, Satoru, to Kyowa Hakko Kogyo Co., Ltd. Pyrroloindole derivatives related to DC-88A compound. 5,070,092, Cl. 514-253.000.

Kanegafuchi Chemical Ind. Co., Ltd.: *See*—
Kawai, Hideki; Akahori, Kiyokazu; and Nagano, Hirosaku, 5,070,181, Cl. 528-353.000.

Kaneko, Denziro: *See*—
Ohneda, Noboru; Ushioda, Shunta; Arima, Haruo; Hashimoto, Ichiro; Kaneko, Denziro; and Sugiyama, Kazuo, 5,069,055, Cl. 72-283.000.
Ohneda, Noboru; Ushioda, Shunta; Arima, Haruo; Hashimoto, Ichiro; Kaneko, Denziro; Sugiyama, Kazuo; Fukazawa, Tsuguo; Tachi, Teruo; and Mukasa, Takashi, 5,069,095, Cl. 82-124.000.

Kaneko, Kiyoshi: *See*—
Tanaka, Atsushi; Kaneko, Kiyoshi; Yoshimura, Yuichiro; Suzuki, Noriyuki; Kobayashi, Katsuyuki; Mori, Shigeki; and Taniishi, Shinnosuke, 5,070,325, Cl. 340-706.000.

Kaneko, Shiro: *See*—
Yasunaga, Tadashi; Kaneko, Shiro; and Sano, Kunihiko, 5,069,933, Cl. 427-130.000.

Kaneshima, Yasuo: *See*—
Oyamada, Takeo; Taira, Yoshito; Nitta, Masayoshi; Kaneshima, Yasuo; Kurino, Tateshi; and Narisawa, Shizuo, 5,070,134, Cl. 524-503.000.

Kanjo, Wajih; Krampitz, Mark S.; and Moriarity, Michael J., to Westinghouse Air Brake Company. Handbrake for single-cylinder truck-mounted railway car brake. 5,069,312, Cl. 188-52.000.

Kanne, David B.: *See*—
Broadhurst, Michael D.; Cormartie, Thomas H.; Fisher, Karl J.; Haag, William G.; Kanne, David B.; and Leadbetter, Michael R., 5,070,210, Cl. 549-350.000.

Kanno, Isao, to Sanshin Kogyo Kabushiki Kaisha. Fuel supplying device for marine propulsion engine. 5,069,174, Cl. 123-179.160.

Kansai Paint Co., Ltd.: *See*—
Murata, Masahiro; Tanaka, Yukiyasu; and Kokawa, Tomoo, 5,069,956, Cl. 428-216.000.
Seko, Kenji; Akaki, Yuu; Iwasawa, Naozumi; and Kondo, Toshio, 5,070,000, Cl. 430-280.000.
Tominaga, Akira, 5,069,767, Cl. 204-181.700.

Kanzaki Kokyukoki Mfg. Co., Ltd.: *See*—
Sakigawa, Shigenori; Ohashi, Ryota; Shibata, Jiro; and Kawamura, Masahisa, 5,069,037, Cl. 60-435.000.

Kanzaki Paper Mfg. Co., Ltd.: *See*—
Tani, Hisashi; and Yagi, Hisanori, 5,070,067, Cl. 503-219.000.

Kao Corporation: *See*—
Ito, Osamu; and Mizutani, Hiroshi, 5,069,676, Cl. 604-358.000.
Sakurai, Akira; and Torimae, Yasuhiro, 5,069,677, Cl. 604-370.000.
Yanai, Hidetoshi; and Ishikawa, Akira, 5,069,963, Cl. 428-323.000.

Kapec, Jeffrey: *See*—
Moyher, George C., Jr.; Jamerson, Randy; Nessim, David; Kapec, Jeffrey; Tanaka, Kazuna; and Chochinov, Allan, 5,069,782, Cl. 210-192.000.

Kappele, William D., to Hewlett-Packard Company. Potassium substituted inks for ink-jet printers. 5,069,718, Cl. 106-22.000.

Kappeler, Franz; and Wolf, Thomas, to Siemens Aktiengesellschaft. Laser arrangement having at least one laser resonator and a passive resonator coupled thereto. 5,070,511, Cl. 372-50.000.

Karel, Marcus: *See*—
Graf, Ernst; Karel, Marcus; and Saguy, Israel A., 5,069,918, Cl. 426-243.000.

Karlson, Eskil L. Ozone sterilizer. 5,069,880, Cl. 422-186.190.

Karmen, Arthur: *See*—
Freundlich, Lawrence F.; and Karmen, Arthur, 5,069,667, Cl. 604-110.000.

Karol, Frederick J.: *See*—
Cann, Kevin J.; Karol, Frederick J.; and Marcinkowsky, Arthur E., 5,070,057, Cl. 502-119.000.
Schramm, Kathleen D.; and Karol, Frederick J., 5,070,055, Cl. 502-107.000.

Karst, Dennis L.: *See*—
Block, Timothy R.; Ebler, Marcia B.; Freitag, Ladd W.; Heiling, Gerald M.; Holter, Spencer C.; Karst, Dennis L.; Siljenberg, David W.; Soderstrom, Ronald L.; and Trnka, John T., 5,069,522, Cl. 385-39.000.

Kasatani, Ryuichiro: *See*—
Yarita, Kenichi; Tada, Takahisa; and Kasatani, Ryuichiro, 5,070,208, Cl. 548-494.000.

Kaschemekat, Jurgen; Baker, Richard W.; and Wijmans, Johannes G., to Membrane Technology & Research, Inc. Membrane module. 5,069,793, Cl. 210-640.000.

Kase, Mitsuo; Kawasaki, Yoichi; and Okoshi, Noboru, to Dainippon Ink and Chemicals, Inc. Process for the preparation of polyisocyanate. 5,070,137, Cl. 524-590.000.

Kaseda, Shigeru: *See*—
Niinomi, Toshihiko; Funakoshi, Ryohei; Kaseda, Shigeru; and Takahashi, Koichi, 5,070,468, Cl. 364-550.000.

Kasselman, Leslie L. Pet food container. 5,069,167, Cl. 119-61.000.

Katahara, Keith W., to Atlantic Richfield Company. Acoustic signal transmitter for logging tools. 5,069,307, Cl. 181-105.000.

Katayama, Shigeru; Tominaga, Kaoru; Suetsugu, Toshio; and Matsumoto, Kazumi, to Mitsui Petrochemical Industries, Ltd. Method of removing flash from a semiconductor leadframe using coated leadframe and solvent. 5,070,041, Cl. 437-214.000.

Kato, Akira; Nishikawa, Takafumi; and Masuda, Shun, to Honda Giken Kogyo K.K. Fuel supply control system for internal combustion engines. 5,069,187, Cl. 173-492.000.

Kato, Mariko: *See*—
Arai, Takeo; Kato, Mariko; and Nagashima, Toshiharu, 5,070,005, Cl. 430-523.000.

Kato, Mikio: *See*—
Kuzuya, Susumu; Shimizu, Seiji; Kato, Mikio; Ishikawa, Yujiro; Sakai, Takashi; and Yuki, Eiji, 5,069,557, Cl. 400-120.000.

Kato, Noboru; and Fujiwara, Youichi, to Nisshinbo Industries, Inc. Device for preventing dislodgment of disc brake pads. 5,069,313, Cl. 188-72.300.

Kato, Senji; and Oba, Hidehiro, to Toyoto Jidosha Kabushiki Kaisha. Apparatus for control and intake air amount prediction in an internal combustion engine. 5,069,184, Cl. 123-422.000.

Kato, Takahisa: *See*—
Kawajiri, Ryoichi; Uematsu, Hiroshi; and Kato, Takahisa, 5,069,372, Cl. 222-541.000.

Kato, Takeo: *See*—
Nakasaki, Eiji; Shirashoji, Hisashi; Hoshikawa, Katsuyuki; Kamijo, Takao; Ikeda, Kazushige; Inoue, Yasuhiro; and Kato, Takeo, 5,069,262, Cl. 152-536.000.

Kato, Tetsuro; and Nakamura, Yoshiyuki, to Sony Corporation. Video image transforming method and apparatus. 5,070,465, Cl. 395-141.000.

Katsukawa, Hiroyuki: *See*—
Seike, Shoji; Mori, Koichi; Ikeda, Mitsuji; Nozaki, Masayuki; Okajima, Hisakazu; Katsukawa, Hiroyuki; Nakanishi, Kazumi; and Doi, Kenji, 5,069,525, Cl. 385-100.000.

Katsuta, Masanori, to Kabushiki Kaisha Kawai Gakki Seisakusho. Key guide apparatus for electronic musical instrument. 5,070,218, Cl. 200-5.00A.

Katz, David H., to Lidak Pharmaceuticals. Systemic antiviral treatment. 5,070,107, Cl. 514-724.000.

Katz, Mordechai: *See*—
Bornstein, Aharon; Wolfman, Dan; and Katz, Mordechai, 5,070,243, Cl. 250-341.000.

Kaufman, Charles W.: *See*—
Hawe, William R.; Tardo, Joseph J.; Kaufman, Charles W.; Gupta, Amar; Spinney, Barry A.; and Waters, Gregory M., 5,070,528, Cl. 380-48.000.

Kaufman, John W.: *See*—
Buck, Jonathan E.; and Kaufman, John W., 5,069,627, Cl. 439-66.000.

Kaufman, William H.; Harrison, Frederick A.; Gidman, Claude J.; and Beekenkamp, Gerald, to William H. Kaufman Inc. Downhill ski boot assembly. 5,068,984, Cl. 36-117.000.

Kaufmann, Friedrich; Schlossherr, Horst-Werner; and Zinn, Egon, to Isover Saint-Gobain. Thermal marking device for webs of mineral wool and a method of applying the markings. 5,069,122, Cl. 101-9.000.

Kautt & Bux KG: *See*—
Weber, Edwin, 5,070,221, Cl. 200-284.000.

Kautt, Jean-Jacques, to Ferco International Usine de Ferrures de Batiment. Automatic flexible seal fitting machine, suitable for fitting glazing unit and window seals. 5,069,739, Cl. 156-468.000.

Kavanagh, Dean L.; and Simon, Robert H. M., to Monsanto Company. Dimensional stabilizing process. 5,069,734, Cl. 156-84.000.

Kawada, Norihiko: *See*—
Nishida, Yasuaki; Fujita, Yoshihiro; Iino, Yoshiki; and Kawada, Norihiko, 5,069,530, Cl. 359-498.000.
Kawai, Hideki; Akahori, Kiyokazu; and Nagano, Hirosaku, to Kanegafuchi Chemical Ind. Co., Ltd. Polyimide film. 5,070,181, Cl. 528-353.000.
Kawajiri, Ryoichi; Uematsu, Hiroshi; and Kato, Takahisa, to Dai Nippon Insatsu Kabushiki Kaisha. Carton equipped with liquid pouring-out device. 5,069,372, Cl. 222-541.000.
Kawamoto, Kazumi: *See*—
Fukushima, Atsuko; Hira, Yasuo; Sato, Hidemi; Kawamoto, Kazumi; Ito, Kenchi; Shiba, Masataka; and Arimoto, Akira, 5,070,488, Cl. 360-44.120.
Kawamura, Chikayoshi: *See*—
Kuzukawa, Kiyoaki; and Kawamura, Chikayoshi, 5,070,315, Cl. 335-128.000.
Kawamura, Hideo, to Isuzu Motors Limited. Engine with variable combustion chamber. 5,069,178, Cl. 123-256.000.
Kawamura, Hideo, to Isuzu Ceramics Research Institute Co., Ltd. Electromagnetic force valve driving apparatus. 5,069,422, Cl. 251-129.100.
Kawamura, Masaharu: *See*—
Haraguchi, Shosuke; Kawamura, Masaharu; and Morishima, Hideki, 5,070,349, Cl. 354-152.000.
Kawamura, Masahisa: *See*—
Sakigawa, Shigenori; Ohashi, Ryota; Shibata, Jiro; and Kawamura, Masahisa, 5,069,037, Cl. 60-435.000.
Kawanishi, Kiyotaka: *See*—
Fukumoto, Katsuhisa; Kawanishi, Kiyotaka; Nakada, Ryo; and Yamano, Junpei, 5,069,960, Cl. 428-310.500.
Kawanishi, Masaki: *See*—
Yonekawa, Takashi; Buma, Shuuichi; Aburaya, Toshio; Sato, Kunihito; Kawanishi, Masaki; Hamada, Toshiaki; and Tagawa, Shinichi, 5,069,475, Cl. 280-707.000.
Kawano, Tsutomu: *See*—
Suzuki, Junji; and Kawano, Tsutomu, 5,070,398, Cl. 358-37.000.
Kawasaki, Yoichi: *See*—
Kase, Mitsuo; Kawasaki, Yoichi; and Okoshi, Noboru, 5,070,137, Cl. 524-590.000.
Kawashima, Hiroshi: *See*—
Ohara, Osamu; Takata, Hiroshi; and Kawashima, Hiroshi, 5,069,141, Cl. 105-30.000.
Kawashima, Shinji: *See*—
Iijima, Takashi; and Kawashima, Shinji, 5,069,127, Cl. 101-415.100.
Kawashita, Asayoshi, to Hitachi, Ltd. Disc drive unit and method and system for controlling the same. 5,070,417, Cl. 360-71.000.
Kawata, Hiroyuki: *See*—
Tsutsumi, Yasuhiro; Yokoya, Yuji; Hara, Yoshimichi; Matsunaga, Eiju; Kawata, Hiroyuki; Fukami, Akira; and Suzuki, Yutaka, 5,069,476, Cl. 280-707.000.
Kay, John: *See*—
Shimirak, Gerald L.; Chan, Paul S.; Kay, John; Croce, Jim; Huynh, Van L.; Swinmurn, John; and Bierlein, Eric, 5,069,636, Cl. 439-412.000.
Kayama, Tsutomu: *See*—
Kitazawa, Hideki; Terada, Ryohei; Takeuchi, Shogo; Kayama, Tsutomu; Tanimoto, Kohichi; Utsugi, Nobuo; and Nagai, Yoshiaki, 5,070,431, Cl. 362-31.000.
Kayanuma, Nobuaki, to Toyota Jidosha Kabushiki Kaisha. Misfire detecting system in double air-fuel ratio sensor system. 5,069,035, Cl. 60-274.000.
Kaysersberg Packaging, S.A.: *See*—
Ruemeli, Roberg; and Heitzler, Gerard, 5,069,738, Cl. 156-444.000.
Kazami, Kazuyuki; Daitoku, Koichi; Ezawa, Akira; Ohtsuka, Kazuto; and Inoue, Hideya, to Nikon Corporation. Battery check device for cameras. 5,070,357, Cl. 354-468.000.
Kazunari, omatsu: *See*—
Hanada, Mariko; Kazuo, Okino; and Kazunari, omatsu, 5,070,318, Cl. 338-34.000.
Kazuo, Okino: *See*—
Hanada, Mariko; Kazuo, Okino; and Kazunari, omatsu, 5,070,318, Cl. 338-34.000.
Keating, Raymond E., to Cornerstone Products, Inc. Mobile leaf bag loading fixture. 5,069,405, Cl. 248-98.000.
Kee, David R.: *See*—
Johnson, Richard E.; Davis, Dennis D.; Kee, David R.; Orcutt, John W.; and Hightower, Angus W., 5,070,039, Cl. 437-207.000.
Keeler, Jim: *See*—
Lahut, Joseph; and Keeler, Jim, 5,070,345, Cl. 346-1.100.
Keil & Weinkauf: *See*—
Schwalm, Reinhold; and Binder, Horst, 5,069,997, Cl. 430-270.000.
Keime, Francois: *See*—
Vanvoren, Claude; Coste, Benoit; and Keime, Francois, 5,069,842, Cl. 264-101.000.
Keiper Recaro GmbH & Co.: *See*—
Amthor, Thomas; Neumann, Erwin; von Rolbicki, Wolfgang; and Starke Frank, 5,069,505, Cl. 297-216.000.
Kelly, John A.: *See*—
Hwa, Chih M.; Kelly, John A.; Neton, Janet; Scanlon, Patricia M.; and Gaudette, Roger R., 5,069,798, Cl. 210-700.000.
Kemmler-Sack, Sybille: *See*—
Blanke, Inge; Burckhardt, Hans-Georg; Gora, Frieder; Guldner, Karlheinz; Dehoust, Jurgen; Modes, Christina; Kemmler-Sack, Sybille; and Schmidt, Joachim, 5,069,824, Cl. 252-518.000.
Kendrick, Ray; and Tatum, Gary, to Daniel Industries, Inc. Orifice system intermediate interface. 5,069,252, Cl. 138-44.000.
Kennedy, David; Mussett, Gerard; Van Maanan, Alfons; and Smetham, James N., to ICI Australia Operations Proprietary Limited. Primer. 5,069,131, Cl. 102-275.600.
Kerfoot, Charles S.: *See*—
Milberger, Walter E.; Kerfoot, Charles S.; and Jones, Franklin B., 5,070,538, Cl. 455-126.000.
Kerplas S.N.C.: *See*—
Belmont, Pierre, 5,069,614, Cl. 425-525.000.
Kerrigan, James E., to Duo-Fast Corporation. Fastener driving tool. 5,069,379, Cl. 227-131.000.
Kersten, Peter; and Hanisch, Helmut, to Alcatel N.V. Integrated optical waveguide. 5,069,517, Cl. 385-130.000.
Kesner, Leo: *See*—
Medina, Victor; Stracher, Alfred; and Kesner, Leo, 5,070,074, Cl. 514-3.000.
Keyser, William L.; Medrow, Ronald K.; and Milling, Thomas E., to Quaker Oats Co., The. Method of preparing hot oat cereal in a microwave oven. 5,069,917, Cl. 426-243.000.
Khadzhi, Valentin E.: *See*—
Borodin, Vadim L.; Dronov, Valery V.; and Khadzhi, Valentin E., 5,069,744, Cl. 156-623.00R.
Khanna, Jag M.; Kumar, Naresh; Bala, Kiran; and Kumar, Yatendra, to Ranbaxy Laboratories Limited. Ring-opening process for preparation of 2-chlorosulfinyl azetidinones. 5,070,195, Cl. 540-218.000.
Khavinson, Vladimir K.: *See*—
Morozov, Vyacheslav G.; and Khavinson, Vladimir K., 5,070,076, Cl. 514-21.000.
Kiang, Teddy T.: *See*—
Holloway, Robert R.; and Kiang, Teddy T., 5,070,158, Cl. 525-475.000.
Kida, Michio; and Sahira, Kensho, to Mitsubishi Kinzoku Kabushiki Kaisha. Method of manufacturing quartz double crucible assembly. 5,069,741, Cl. 156-617.100.
Kido, Yoshinobu: *See*—
Matsuno, Yuji; Kido, Yoshinobu; and Sugiyama, Yoshiharu, 5,069,084, Cl. 74-844.000.
Kiefer, Berthold; and Schmitt, Franz, to Siemens Aktiengesellschaft. Slice profile optimization for a nuclear magnetic resonance tomography apparatus operated with a gradient echo sequence. 5,070,299, Cl. 324-309.000.
Kikawa, Takeshi; Tsuji, Kazutaka; Sameshima, Kenji; Hirai, Tadaaki; Yamazaki, Junichi; Kubota, Misao; and Shidara, Keiichi, to Hitachi, Ltd.; and Nippon Hoso Kyokai. Photoconductive device and method of operating same. 5,070,272, Cl. 313-386.000.
Kikkawa, Takashi: *See*—
Shirosaki, Takehiro; Kikkawa, Takashi; and Toshima, Hirotaka, 5,069,874, Cl. 420-478.000.
Kikuchi, Akihiro; and Fukuda, Tokuya, to Sony Corporation. Focusing apparatus and digital filters for use therewith. 5,070,408, Cl. 358-227.000.
Kikuchi, Ryo: *See*—
Sasaoka, Michio; Saito, Nori; Shiroi, Takashi; Nagao, Shigemitsu; Kikuchi, Ryo; and Kameyama, Yutaka, 5,070,194, Cl. 540-214.000.
Kilgore, Marion D., to Otis Engineering Corporation. Gas lift valve utilizing a diaphragm pilot. 5,069,242, Cl. 137-155.000.
Kim, Ki I. Electromagnetic inflator used in compact vehicle air bag apparatus. 5,069,478, Cl. 280-733.000.
Kim, Kwang T.; Kim, Tae H.; and Kim, Young S., to Cheil Synthetics Inc. Water-soluble copolymerized polyester resin composition. 5,070,179, Cl. 528-272.000.
Kim, Tae H.: *See*—
Kim, Kwang T.; Kim, Tae H.; and Kim, Young S., 5,070,179, Cl. 528-272.000.
Kim, Young H., to Du Pont de Nemours, E. I., and Company. Hyperbranched polyarylene. 5,070,183, Cl. 528-397.000.
Kim, Young S.: *See*—
Kim, Kwang T.; Kim, Tae H.; and Kim, Young S., 5,070,179, Cl. 528-272.000.
Kimura, Akira; Kitao, Nobuo; Yasuda, Hiroshi; Shimomura, Yoshimasa; Isozaki, Kiyoshi; and Nishimura, Hiroshi, to Tsubakimoto Chain Co. Flexible supporting sheath for cables and the like. 5,069,486, Cl. 285-166.000.
Kimura, Morio: *See*—
Wasimoto, Takasi; and Kimura, Morio, 5,069,640, Cl. 439-619.000.
Kimura, Noriyuki: *See*—
Yamamoto, Masamitsu; Kimura, Noriyuki; Fujioka, Yoshihisa; Yamamoto, Hiroki; and Suekane, Makoto, 5,069,678, Cl. 604-385.100.
Kimura, Tadashi; and Ikeda, Tanejiro, to Matsushita Electric Industrial Co., Ltd. Method for manufacturing a film capacitor. 5,069,746, Cl. 156-633.000.
Kimura, Toshihiro: *See*—
Sano, Takenosuke; Koike, Keiichi; Sato, Hajime; Kimura, Toshihiro; and Enokido, Yutaka, 5,070,267, Cl. 310-89.000.
Kimura, Yoshiharu: *See*—
Kitao, Toshio; Kimura, Yoshiharu; Yamane, Hideki; and Hashimoto, Koichi, 5,069,854, Cl. 264-205.000.
Kinetico, Incorporated: *See*—
Brown, Keith E.; and Kirman, Lyle E., 5,069,779, Cl. 210-87.000.
King, Jerrold L.: *See*—
Fogal, Rich; King, Jerrold L.; and Moden, Walter L., 5,070,042, Cl. 437-220.000.
Kinlen, Patrick J.: *See*—
Silverman, David C.; Lefelar, Judith A.; and Kinlen, Patrick J., 5,069,974, Cl. 428-422.000.

Kinoshita, Kenichi, to Tel Sagami Limited. Semiconductor wafer-processing apparatus. 5,069,591, Cl. 414-156.000.

Kinoshita, Takao, to Canon Kabushiki Kaisha. Image sensing apparatus having a low-resolution monitor, means for reducing the amount of information in an image signal, and switching means for reducing power consumption in various operating modes. 5,070,406, Cl. 358-224.000.

Kinsey, William H.: *See—*
Cohen, Robert S.; Pierce, James M.; and Kinsey, William H., 5,069,906, Cl. 424-430.000.

Kinzig, Volker: *See—*
Schuetz, Guenter; Stueber, Hans-Guenter; and Kinzig, Volker, 5,069,603, Cl. 417-423.400.

Kirikami, Seiichi: *See—*
Kuroda, Michio; Kirikami, Seiichi; Hisano, Katsukuni; Iizuka, Nobuyuki; Urushidani, Haruo; Sato, Isao; Ishibashi, Yoji; and Ohmori, Takashi, 5,069,029, Cl. 60-39.060.

Kirman, Lyle E.: *See—*
Brown, Keith E.; and Kirman, Lyle E., 5,069,779, Cl. 210-87.000.

Kishi, Katsunobu; and Nose, Kinya, to Nitto Kohki Co., Ltd. Safety device for a pneumatic tool. 5,069,421, Cl. 251-99.000.

Kishi, Yasuo: *See—*
Kouzuma, Shinichi; Inoue, Hiroshi; Murata, Kenji; Tanaka, Hiroyuki; and Kishi, Yasuo, 5,069,727, Cl. 136-251.000.

Kishida, Daisuke: *See—*
Nakamura, Yoshio; Shinohara, Junichi; and Kishida, Daisuke, 5,070,356, Cl. 354-439.000.

Kishikawa, Nobutaka; Mita, Akira; and Satou, Mitsugi, to Gunze Limited. Heat-shrinkable foamed composite film and process for preparation of same. 5,069,953, Cl. 428-201.000.

Kistner, Herbert; and Weber, Christian, to UPAT GmbH & Company. Process for anchoring of fasteners in a base. 5,069,581, Cl. 405-259.600.

Kita, Nobuyuki: *See—*
Higashi, Tatsuji; Tsuchiya, Mitsumasa; and Kita, Nobuyuki, 5,069,999, Cl. 430-272.000.

Kitagawa, Masatoshi: *See—*
Mito, Yoshio; Kitagawa, Masatoshi; Hirao, Takashi; Yasuno, Yoshitake; and Hirano, Ryuma, 5,070,027, Cl. 437-15.000.

Kitagishi, Nozomu, to Canon Kabushiki Kaisha. Image deflecting device. 5,069,537, Cl. 359-557.000.

Kitahara, Takahiro: *See—*
Ohmori, Akira; Inukai, Hiroshi; Kitahara, Takahiro; and Ueda, Akihiko, 5,069,941, Cl. 427-385.500.

Kitajima, Tomoya; and Suzuki, Akira, to Ricoh Company, Ltd. Apparatus for measuring distances at many points. 5,069,543, Cl. 356-4.000.

Kitamori, Takehiko: *See—*
Matsui, Tetsuya; Kitamori, Takehiko; Yokose, Kenji; and Sakagami, Masaharu, 5,070,300, Cl. 324-464.000.

Kitano, Kisei: *See—*
Suzuki, Toshiharu; Goto, Yasuyuki; and Kitano, Kisei, 5,069,814, Cl. 252-299.670.

Kitano, Kisuke: *See—*
Omure, Yukio; and Kitano, Kisuke, 5,070,113, Cl. 521-131.000.

Kitao, Nobuo: *See—*
Kimura, Akira; Kitao, Nobuo; Yasuda, Hiroshi; Shimomura, Yoshimasa; Isozaki, Kiyoshi; and Nishimura, Hiroshi, 5,069,486, Cl. 285-166.000.

Kitao, Toshio; Kimura, Yoshiharu; Yamane, Hideki; and Hashimoto, Koichi, to Kyoto Institute of Technology. Alumina fiber with carbon inclusion and a method of producing the same. 5,069,854, Cl. 264-205.000.

Kitaura, Masahiro; and Uchida, Tomoaki, to Victor Company of Japan, Ltd. Television signal system conversion apparatus. 5,070,395, Cl. 358-11.000.

Kitazawa, Hideki; Terada, Ryohei; Takeuchi, Shogo; Kayama, Tsutomu; Tanimoto, Kohichi; Utsugi, Nobuo; and Nagai, Yoshiaki, to Pioneer Electronic Corporation. Display board illuminating device for passive displays. 5,070,431, Cl. 362-31.000.

Kitazumi, Satoshi; and Saito, Katsuhisa, to Koito Manufacturing Co., Ltd. Projector-type automobile headlamp having improved appearance. 5,070,432, Cl. 362-61.000.

Kito, Yasutami: *See—*
Iwasa, Masao; and Kito, Yasutami, 5,070,426, Cl. 361-91.000.

Kitoh, Masayuki: *See—*
Yoshikawa, Masanori; Tateno, Haruo; Obana, Hiroshi; Itoh, Tsutomu; Saitoh, Hiroshi; and Kitoh, Masayuki, 5,070,274, Cl. 315-111.210.

Kitou, Kouji: *See—*
Okuyama, Nobutaka; Sakurai, Soichi; Kitou, Kouji; Ohsawa, Michitaka; Niitsu, Ichiro; Yoshioka, Hiroshi; Takeyama, Atushi; Obara, Masao; and Yoshimi, Isao, 5,070,280, Cl. 315-368.110.

Kiyonaga, Chitoku, to Sharp Kabushiki Kaisha. Method and apparatus for recording and reproducing of a recording medium. 5,070,419, Cl. 360-72.200.

Klawiter, James A., to Graber Industries, Inc. Hold-down bracket for bottom rail of a window covering. 5,069,264, Cl. 160-178.100.

Klearfold, Inc.: *See—*
Herrin, Melvin B.; and Mazurek, Richard, 5,069,334, Cl. 206-45.340.

Kleemola, Pertti, to Yhtyneet Paperitehtaat Oy Walki-Pakkaus. Device for reducing the thickness of the edge of a board web or board sheets. 5,069,101, Cl. 83-869.000.

Kleer-Vu Plastics Corporation: *See—*
Acker, Fred, 5,069,568, Cl. 402-73.000.

Klein, Christian; Batz, Hans-Georg; Essig, Ulrich; and Naujoks, Kurt W., to Boehringer Mannheim GmbH. Process for the determination of a protein according to fluorescence polarization immunoassay principle. 5,070,025, Cl. 436-546.000.

Kleine-Altekamp, Harald, to Alcatel N. V. Transmission network with switchable network nodes. 5,070,497, Cl. 370-14.000.

Kleinhen, Stephen R.; and Bryson, Robert A., Sr., to AM International Incorporated. Apparatus and method for loading sheet material articles. 5,069,598, Cl. 414-790.000.

Klemarczyk, Philip T.; and Okamoto, Yoshihisa, to Loctite Corporation. Aromatic vinyl ether compounds and compositions, and method of making the same. 5,070,117, Cl. 522-31.000.

Kliman, Harvey L.: *See—*
Gentile, Wayne F.; and Kliman, Harvey L., 5,069,959, Cl. 428-294.000.

Klippenstein, John: *See—*
Reinson, Lorne R.; Akerman, Mark J.; and Klippenstein, John, 5,069,494, Cl. 294-1.200.

Klockner-Becorit GmbH: *See—*
Schupphaus, Dieter; and Nowak, Hans D., 5,069,328, Cl. 198-731.000.

Kloeckner-Humboldt-Deutz AG: *See—*
Schorn, Norbert; Stock, Hugo; Bartels, Richard; and Fendel, Willi, 5,069,036, Cl. 60-323.000.

Klugkist, Jan: *See—*
Lagerwaard, Cornelis A.; Cornelissen, Johannes M.; Swarthoff, Ton; Klugkist, Jan; and Thom, David, 5,069,809, Cl. 252-174.120.

KM-Kabel Metall AG: *See—*
Gravemann, Horst, 5,069,270, Cl. 164-481.000.

Knape & Vogt Manufacturing Company: *See—*
Bessinger, Walter L., 5,069,408, Cl. 248-250.000.

Knittel, Gerald H.: *See—*
McClintock, Jack M.; and Knittel, Gerald H., 5,069,969, Cl. 428-36.500.

Knoblich, Stanley M., to SpaceLabs, Inc. Self snugging universal blood pressure cuff. 5,069,219, Cl. 128-679.000.

Knox, David J.: *See—*
Hogregfe, Robert; Knox, David J.; and Newman, George E., 5,069,003, Cl. 51-283.00R.

Knurr, Hans, to Knurr-Mechanik fur die Elektronik Aktiengesellschaft. Container with a carrying handle. 5,068,944, Cl. 16-112.000.

Knurr-Mechanik fur die Elektronik Aktiengesellschaft: *See—*
Knurr, Hans, 5,068,944, Cl. 16-112.000.

Kobayashi, Eiji: *See—*
Kanda, Yutaka; Uosaki, Youichi; Saito, Hiromitsu; Sano, Hiroshi; Kobayashi, Eiji; Morimoto, Makoto; and Nagamura, Satoru, 5,070,092, Cl. 514-253.000.

Kobayashi, Kaoru, to Victor Company of Japan, Ltd. Image signal processing device. 5,070,394, Cl. 358-11.000.

Kobayashi, Katsuyuki: *See—*
Tanaka, Atsushi; Kaneko, Kiyoshi; Yoshimura, Yuichiro; Suzuki, Noriyuki; Kobayashi, Katsuyuki; Mori, Shigeki; and Taniishi, Shinnosuke, 5,070,325, Cl. 340-706.000.

Kobayashi, Seiji; and Miyazaki, Masaharu, to Sanshin Kogyo Kabushiki Kaisha. Cowling and air inlet device for outboard motor. 5,069,644, Cl. 440-77.000.

Kobayashi, Tadashi; and Kudo, Tetuo, to NEC Corporation. Coordinate input device capable of indicating a failure in a coordinate indicator. 5,070,217, Cl. 178-19.000.

Kobayashi, Takashi: *See—*
Kohtoh, Noriaki; Kobayashi, Takashi; and Yukawa, Masahiko, 5,070,182, Cl. 528-353.000.

Kobayashi, Toshio, to Fuji Jukogyo Kabushiki Kaisha. Power transmission system for a four-wheel drive motor vehicle. 5,069,305, Cl. 180-249.000.

Kobayashi, Yoshiyuki; Suehaga, Takashi; Mouri, Isamu; and Fujii, Tukasa, to Central Glass Company, Limited. Method of cleaning carbon member contaminated with inorganic deposits. 5,069,724, Cl. 134-37.000.

Kobayashi, Yoshiyuki: *See—*
Suenaga, Takashi; Fujii, Tukasa; and Kobayashi, Yoshiyuki, 5,069,887, Cl. 423-240.00V.

Kobelia, Rudolph G.: *See—*
Smith, Paul R.; Wolfgram, Orval F.; and Kobelia, Rudolph G., 5,069,329, Cl. 198-752.000.

Kochler, Helmut; and Nestler, Gunter, to Erika Kochler. Method and circuit for retuning the frequency of a frequency source. 5,070,517, Cl. 375-117.000.

Kodama, Shinji; Yamada, Satoshi; and Yagi, Sakai, to Yazaki Corporation. Metal terminal retaining mechanism for connector. 5,069,639, Cl. 439-595.000.

Koehly, Gerard: *See—*
Machuron-Mandard, Xavier; Madic, Charles; and Koehly, Gerard, 5,069,827, Cl. 252-626.000.

Kofler, Bojan: *See—*
Kovacic, Mateja; Milovac, Jenny; Cvelbar, Polona; Stalc, Anton; Trost, Zvezdana; Kopitar, Zdravko; Kofler, Bojan; Nikolic, Vida; Lampret, Marija; and Lippai, Marija, 5,069,910, Cl. 424-464.000.

Kohlsdorfer, Christian: *See—*
Mohrs, Klaus; Perzborn, Elisabeth; Seuter, Friedel; Fruchtmann, Romanis; and Kohlsdorfer, Christian, 5,070,096, Cl. 514-311.000.

Kohn, Philip D.: *See—*
Singer, Jerome R.; Grunbaum, Francisco A.; Kohn, Philip D.; Zubelli, Jorge P.; Couch, John L.; Naparst, Harold L.; and Latham, Geoffrey, 5,070,455, Cl. 364-413.190.

Kohtoh, Noriaki; Kobayashi, Takashi; and Yukawa, Masahiko, to Nissan Chemical Industries Ltd. Polyimide resin and insulating film for electric and electronic devices. 5,070,182, Cl. 528-353.000.

Kohy, Lowell I.; and Kaczorowski, Damian, to Raynet Corporation. Telecommunications closures. 5,069,516, Cl. 350-96.100.

Koide, Teruhiko; Buma, Kozi; Ogasawara, Takashi; and Shinto, Hiroaki, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Air bag device. 5,069,479, Cl. 280-734.000.

Koike, Keiichi: *See*—
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Koike, Syuzo: *See*—
Taniguchi, Naohiro; Koike, Syuzo; Watanabe, Yasuhiko; Takeuchi, Tadao; and Fujiwara, Noboru, 5,069,784, Cl. 210-205.000.

Koito Manufacturing Co., Ltd.: *See*—
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Koizumi, Masumi: *See*—
Nomoto, Tsutomu; Koizumi, Masumi; and Nishiki, Akihiko, 5,070,379, Cl. 357-23.700.

Kojima, Takao; and Minamibata, Yukimitsu, to Jidosha Kiki Co., Ltd. Valve sleeve. 5,069,425, Cl. 251-359.000.

Kokawa, Tomoo: *See*—
Murata, Masahiro; Tanaka, Yukiyasu; and Kokawa, Tomoo, 5,069,956, Cl. 428-216.000.

Kole, Richard L., to Design Opportunity Corp. Expandable finger guard for a hypodermic needle cap. 5,069,669, Cl. 604-198.000.

Kolton, Chester; and Spater, Stuart S., to A & E Products Group, a division of Carlisle Plastics, Inc. Garment hanger for strapped garments with notching retention. 5,069,373, Cl. 223-85.000.

Komatsu, Koichiro; Mizutani, Hideo; Magome, Nobutaka; and Ota, Kazuya, to Nikon Corporation. Position detection apparatus with adjustable beam and interference fringe positions. 5,070,250, Cl. 250-548.000.

Komiya, Kyosuke: *See*—
Yokota, Masahisa; Shimizu, Atsushi; Komiya, Kyosuke; Yamataka, Kazunori; and Nomura, Tadanori, 5,070,173, Cl. 528-85.000.

Komiya, Yasuhiro; and Nagasaki, Tatsuo, to Olympus Optical Co., Ltd. Automatic focusing apparatus. 5,070,353, Cl. 354-402.000.

Kondo, Hisashi: *See*—
Ibuka, Shigehito; Kondo, Hisashi; Sagami, Shigeru; and Sumi, Koji, 5,070,275, Cl. 315-111.810.

Kondo, Toshio: *See*—
Seko, Kenji; Akaki, Yuu; Iwasawa, Naozumi; and Kondo, Toshio, 5,070,000, Cl. 430-280.000.

Konica Corporation: *See*—
Arai, Takeo; Kato, Mariko; and Nagashima, Toshiharu, 5,070,005, Cl. 430-523.000.
Maekawa, Hideaki; and Miyoshi, Masanobu, 5,070,008, Cl. 430-567.000.
Matsuda, Atsuko; and Goto, Narito, 5,069,949, Cl. 428-141.000.
Murahashi, Takashi; Sugano, Masashi; Maruyama, Hiroyuki; and Yokobori, Jun, 5,070,374, Cl. 355-326.000.
Sugano, Masahi; Murahashi, Takashi; Maruyama, Hiroyuki; and Yokobori, Jun, 5,070,367, Cl. 355-326.000.

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Konushi, Fumihiro; Nakatu, Hiroshi; Inoguchi, Kazuhiko; Okumura, Toshiyuki; Seki, Akinori; Takiguchi, Haruhisa; Nakanishi, Chitose; Sugahara, Satoshi; and Kudo, Hiroaki, to Sharp Kabushiki Kaisha. Semiconductor laser device. 5,070,510, Cl. 372-46.000.

Kopitar, Zdravko: *See*—
Kovacic, Mateja; Milovac, Jenny; Cvelbar, Polona; Stalc, Anton; Trost, Zvezdana; Kopitar, Zdravko; Kofler, Bojan; Nikolic, Vida; Lampret, Marija; and Lippai, Marija, 5,069,910, Cl. 424-464.000.

Kordesch, Karl: *See*—
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Korny, Kazimierez J.: *See*—
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Korostenski, Erwin: *See*—
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Korte, Heinrich: *See*—
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Korzenowski, Walter. Elbow support. 5,069,457, Cl. 273-189.00R.

Kosaka, Tetsuzo: *See*—
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Kosako, Kosei: *See*—
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Kosmowski, Wojciech, to Dynamotion Corporation. Method and apparatus for changing tools in an automated machine tool. 5,068,958, Cl. 29-568.000.

Kosson, Robert L.: *See*—
Haslett, Robert A.; Kosson, Robert L.; and Solon, Martin, 5,069,274, Cl. 165-32.000.

Kost, Friedrich: *See*—
Van Zanten, Anton; Ruf, Wolf-Dieter; Kost, Friedrich; and Weiss, Karl-Josef, 5,070,459, Cl. 364-426.020.

Kotani, Norihiko: *See*—
Kunikiyo, Tatsuya; Fujinaga, Masato; and Kotani, Norihiko, 5,070,469, Cl. 364-578.000.

Kotani, Takaaki; and Takada, Seiji, to Fuji Photo Film Co., Ltd. Range finding device for cameras. 5,070,352, Cl. 354-402.000.

Kouzuma, Shinichi; Inoue, Hiroshi; Murata, Kenji; Tanaka, Hiroyuki; and Kishi, Yasuo, to Sanyo Electric Co., Ltd. Flexible photovoltaic device and manufacturing method thereof. 5,069,727, Cl. 136-251.000.

Kovacevic, Steven: *See*—
Ingolia, Thomas D.; Kovacevic, Steven; Miller, James R.; and Skatrud, Paul L., 5,070,020, Cl. 435-183.000.

Kovacic, Mateja; Milovac, Jenny; Cvelbar, Polona; Stalc, Anton; Trost, Zvezdana; Kopitar, Zdravko; Kofler, Bojan; Nikolic, Vida; Lampret, Marija; and Lippai, Marija, to Lek. Dispersible cimetidine tablets. 5,069,910, Cl. 424-464.000.

Kovaletz, Mark P. Method and apparatus for manipulation of a load for cleaning tower structure components. 5,069,400, Cl. 244-118.100.

Kovalev, Valentin D.: *See*—
Paton, Boris E.; Podgaetsky, Vladimir V.; Varenchuk, Pavel A.; Privalov, Nikolai T.; Galinich, Vladimir I.; Kovalev, Valentin D.; and Romanenko, Yaroslav A., 5,070,225, Cl. 219-73.000.

Koyama, Hiroshi, to Sanyo Electric Co., Ltd. Interrupt circuit and interrupt processing method for microcomputer. 5,070,447, Cl. 395-725.000.

Koza, John R.; Ferguson, John R.; and Torneros, Maximiano D., to Koza, John R. Ticket apparatus with a transmitter. 5,069,453, Cl. 273-139.000.

Krafft, Werner; Helling, Gunter; and Matschke, Gunter, to Agfa Gevaert AG. Photographic material comprising an NC layer. 5,070,006, Cl. 430-531.000.

Krajenbrink, Frans G.: *See*—
Wysocki, Joseph A.; and Krajenbrink, Frans G., 5,069,743, Cl. 156-620.700.

Kramer, Andreas: *See*—
Stockinger, Friedrich; and Kramer, Andreas, 5,070,163, Cl. 526-259.000.

Kramer, Johann; and Renz, Rainer, to Mercedes-Benz AG. Internal combustion engine. 5,069,179, Cl. 123-270.000.

Krampitz, Mark S.: *See*—
Kanjo, Wajih; Krampitz, Mark S.; and Moriarity, Michael J., 5,069,312, Cl. 188-52.000.

Krenitsky, Thomas A.: *See*—
Selway, John W. T.; Beacham, Lowrie M., III; Daluge, Susan M.; Van Tuttle, Joel; and Krenitsky, Thomas A., 5,070,078, Cl. 514-50.000.

Krespan, Carl G.: *See*—
Huang, Hsu-Nan; Hung, Ming-Hong; and Krespan, Carl G., 5,070,213, Cl. 549-448.000.

Kreuz, Monika: *See*—
Finzel, Lothar; Kreuz, Monika; and Bachel, Ernst, 5,069,523, Cl. 385-135.000.

Krings, Reiner; and Schulte, Willy, to Mannesmann Aktiengesellschaft. Method for pretreating the connecting elements of a gas-tight pipe connection. 5,069,761, Cl. 205-183.000.

Krivi, Gwen G.: *See*—
Rotwein, Peter S.; and Krivi, Gwen G., 5,070,075, Cl. 514-12.000.

Kroh, Adolf: *See*—
Dietz, Erwin; Sommer, Andreas; Kroh, Adolf; Hohn, Jurgen; Hafner, Otmar; and Rieper, Wolfgang, 5,070,159, Cl. 525-504.000.

Krueger, R. Ernst, deceased (by Krueger, Vera B., legal representative); and Krueger, William E., to Rudolph E. Krueger, Inc. Drill pipe/casing protector and method. 5,069,297, Cl. 175-65.000.

Krueger, Vera B., legal representative: *See*—
Krueger, R. Ernst, deceased; and Krueger, William E., 5,069,297, Cl. 175-65.000.

Krueger, William E.: *See*—
Krueger, R. Ernst, deceased; and Krueger, William E., 5,069,297, Cl. 175-65.000.

Krumm, Valentin, to Lindauer Dornier Gesellschaft m.b.H. Method for delivering thread to a thread user and apparatus for performing the method. 5,069,395, Cl. 242-47.010.

Kruse, Gary: *See*—
Travis, Terrell; Shagott, David; Kruse, Gary; Sutherland, Daniel; and Harber, Blair, Jr., 5,069,691, Cl. 55-126.000.

Kubbutat, Albert. Holding means for securing facade panels. 5,069,014, Cl. 52-235.000.

Kubo, Kanji; Yamamoto, Akio; and Takeda, Katsumi, to Hitachi, Ltd. Storage system. 5,070,444, Cl. 395-425.000.

Kubota, Misao: *See*—
Kikawa, Takeshi; Tsuji, Kazutaka; Sameshima, Kenji; Hirai, Tadaaki; Yamazaki, Junichi; Kubota, Misao; and Shidara, Keiichi, 5,070,272, Cl. 313-386.000.

Kuczkowski, Joseph A.: *See*—
Sturm, Budd H.; and Kuczkowski, Joseph A., 5,069,819, Cl. 252-402.000.

Kudo, Hiroaki: *See*—
Konushi, Fumihiro; Nakatu, Hiroshi; Inoguchi, Kazuhiko; Okumura, Toshiyuki; Seki, Akinori; Takiguchi, Haruhisa; Nakanishi, Chitose; Sugahara, Satoshi; and Kudo, Hiroaki, 5,070,510, Cl. 372-46.000.

Kudo, Tetuo: *See*—
Kobayashi, Tadashi; and Kudo, Tetuo, 5,070,217, Cl. 178-19.000.

Kudo, Yoshinobu: *See*—
Inoue, Manabu; Taniguchi, Nobuyuki; Nanba, Katsuyuki; Kudo, Yoshinobu; Iwata, Michihiro; and Wada, Shigeru, 5,070,355, Cl. 354-413.000.

Kugo, Takahiro: *See*—
Yamauchi, Kiyoshi; Kugo, Takahiro; and Miyano, Yasuo, 5,069,226, Cl. 128-772.000.

Kuhn, Ullrich: *See*—
Kunh, Gunther; and Kuhn, Ullrich, 5,069,496, Cl. 297-300.000.

Kukla, Reiner: *See*—
Fritsche, Wolf-Eckhart; Lubbehusen, Michael; Kukla, Reiner; and BeiBwenger, Siegfried, 5,069,772, Cl. 204-298.120.

Kulesha, Richard L.; Jones, Michael D.; and Schmitt, Thomas E., to McDonnell Douglas Corporation. Self-stabilized stepped crashworthy stiffeners. 5,069,318, Cl. 188-377.000.

Kulesza, Ralph J. Pocket sized mechanical game. 5,069,460, Cl. 273-355.000.

Kumamoto, Hidechika; and Matsushita, Tsukasa, to Mita Indusatrial Co., Ltd. Apparatus for generating an enlargement/reduction signal. 5,070,412, Cl. 358-451.000.

Kumar, Naresh: *See*—
Khanna, Jag M.; Kumar, Naresh; Bala, Kiran; and Kumar, Yatendra, 5,070,195, Cl. 540-218.000.

Kumar, Yatendra: *See*—
Khanna, Jag M.; Kumar, Naresh; Bala, Kiran; and Kumar, Yatendra, 5,070,195, Cl. 540-218.000.

Kunh, Gunther; and Kuhn, Ullrich. Chair with adjustable seat and back rest. 5,069,496, Cl. 297-300.000.

Kunikiyo, Tatsuya; Fujinaga, Masato; and Kotani, Norihiko, to Mitsubishi Denki Kabushiki Kaisha. Topography simulation method. 5,070,469, Cl. 364-578.000.

Kunisch, Franz: *See*—
Fischer, Reiner; Jensen-Korte, Uta; Kunisch, Franz; Marhold, Albrecht; Ooms, Pieter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,069,711, Cl. 71-92.000.

Kunitomo, Shigeaki. Igniting apparatus for explosive substances. 5,069,129, Cl. 102-200.000.

Kunze-Concewitz, Horst; and Zaiss, Roland, to Convac GmbH. Apparatus for in-line lacquering of compact disks. 5,069,155, Cl. 118-52.000.

Kunze, Edward L. Apparatus for facilitating roadway grade measurements. 5,068,970, Cl. 33-413.000.

Kurakazu, Keiichi: *See*—
Takano, Makoto; Hoshi, Yasuhiko; Kurakazu, Keiichi; and Baba, Shiro, 5,070,473, Cl. 395-725.000.

Kuraray Co., Ltd.: *See*—
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 5,070,172, Cl. 528-76.000.
Moritani, Tohei; Fukutome, Susumu; Motoishi, Yasuo; and Oda, Hidemasa, 5,069,946, Cl. 428-36.600.

Kurino, Tateshi: *See*—
Oyamada, Takeo; Taira, Yoshito; Nitta, Masayoshi; Kaneshima, Yasuo; Kurino, Tateshi; and Narisawa, Shizuo, 5,070,134, Cl. 524-503.000.

Kurita Water Industries Ltd.: *See*—
Taniguchi, Naohiro; Koike, Syuzo; Watanabe, Yasuhiko; Takeuchi, Tadao; and Fujiwara, Noboru, 5,069,784, Cl. 210-205.000.

Kurkjian, Gregory A., Jr., to Henry Pratt Company. Flexible seating structure for rotary valves. 5,069,240, Cl. 137-15.000.

Kuroda, Hirokazu: *See*—
Ishii, Noriyuki; Hirano, Masayasu; Kajita, Hideo; Kuroda, Hirokazu; Izumi, Shuji; Fujino, Akihiko; Ishimura, Toshihiko; and Seki, Reiji, 5,070,234, Cl. 235-441.000.

Kuroda, Michio; Kirikami, Seiichi; Hisano, Katsukuni; Iizuka, Nobuyuki; Urushidani, Haruo; Sato, Isao; Ishibashi, Yoji; and Ohmori, Takashi, to Hitachi, Ltd. Gas turbine combustor and combustion method therefor. 5,069,029, Cl. 60-39.060.

Kuroiwa, Takaaki: *See*—
Miyagishi, Tetsuya; Abe, Toru; and Kuroiwa, Takaaki, 5,069,069, Cl. 73-335.000.

Kurth, Paul A. Method and apparatus for the reduction of soft tissue injury in a femorally catheterized patient. 5,069,229, Cl. 128-877.000.

Kusakawa, Susumu: *See*—
Aoki, Akira; Fujishima, Yukio; Makio, Yusuke; Kusakawa, Susumu; Tsuji, Sadaaki; and Okamura, Tadashi, 5,069,815, Cl. 252-301.360.

Kuster, Hans-Werner: *See*—
d'Iribarne, Benoit; Kuster, Hans-Werner; and Vanaschen, Luc, 5,069,703, Cl. 65-104.000.

Kusunoki, Shigeru: *See*—
Ikeda, Tatsuhiko; Sugahara, Kazuyuki; Kusunoki, Shigeru; and Nishioka, Kyusaku, 5,070,030, Cl. 437-31.000.

Kuwabara, Yoshiharu; and Suzuki, Masamichi, to Mitutoyo Corporation. Optical measuring machine with detachable operating board. 5,069,550, Cl. 356-383.000.

Kuwasawa, Mitsuru: *See*—
Ikeda, Yoshiaki; Kuwasawa, Mitsuru; and Ito, Kenichi, 5,070,288, Cl. 318-618.000.

Kuzukawa, Kiyoaki; and Kawamura, Chikayoshi, to Omron Corporation. Electromagnetic relay. 5,070,315, Cl. 335-128.000.

Kuzuya, Susumu; Shimizu, Seiji; Kato, Mikio; Ishikawa, Yujiro; Sakai, Takashi; and Yuki, Eiji, to Brother Kogyo Kabushiki Kaisha. Device for feeding recording medium in the longitudinal recording direction. 5,069,557, Cl. 400-120.000.

KWC AG: *See*—
Hochstrasser, Ferdinand, 5,069,241, Cl. 137-119.000.

Kwon, Oh-Kyong; Hashimoto, Masashi; Malhi, Satwinder; and Born, Eng C., to Texas Instruments Incorporated. Full wafer integrated circuit testing device. 5,070,297, Cl. 324-158.00P.

Kyokuto Boeki Kaisha, Ltd.: *See*—
Ohira, Sakari; Yamaki, Masatoshi; Terashima, Akira; and Ozawa, Masaaki, 5,070,537, Cl. 455-67.000.

Kyoritsu Electric Corporation: *See*—
Nishi, Masahiro, 5,069,753, Cl. 162-49.000.

Kyoritsu Yuki Co., Ltd.: *See*—
Miyajima, Tooru, 5,070,133, Cl. 524-501.000.

Kyoto Institute of Technology: *See*—
Kitao, Toshio; Kimura, Yoshiharu; Yamane, Hideki; and Hashimoto, Koichi, 5,069,854, Cl. 264-205.000.

Kyowa Hakko Kogyo Co., Ltd.: *See*—
Kanda, Yutaka; Uosaki, Youichi; Saito, Hiromitsu; Sano, Hiroshi; Kobayashi, Eiji; Morimoto, Makoto; and Nagamura, Satoru, 5,070,092, Cl. 514-253.000.

Laboratoire Central des Ponts et Chaussees: *See*—
Soulard, Paul; Chassaing, Paul; and Moreau, Georges, 5,070,286, Cl. 318-568.100.

Lachhein, Stephen; and Willms, Lothar, to Hoechst AG. Process for the preparation of aminopyrimidines. 5,070,201, Cl. 544-320.000.

LaCourse, Joanne: *See*—
Rideout, William C.; Holmstrom, Roger P.; Eichen, Elliot; Powazinik, William; LaCourse, Joanne; Schlafer, John; and Lauer, Robert B., 5,069,561, Cl. 385-14.000.

Ladwig, Paul K.: *See*—
Brownawell, Darrell W.; and Ladwig, Paul K., 5,069,799, Cl. 210-749.000.

Lagarrigue, Francis, to Frametome; and Cogema. Apparatus for the remote unscrewing and extraction of an assembly screw. 5,069,861, Cl. 376-260.000.

Lagerwaard, Cornelis A.; Cornelissen, Johannes M.; Swarthoff, Ton; Klugkist, Jan; and Thom, David, to Lever Brothers Company, Division of Conopco, Inc. Enzymatic detergent and bleaching composition containing a specific rDNA technique cloned lipase. 5,069,809, Cl. 252-174.120.

Lahut, Joseph; and Keeler, Jim, to Dataproducts Corporation. Interlaced ink jet printing. 5,070,345, Cl. 346-1.100.

l'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Rancon, Yannick; and Duchateau, Eric, 5,069,728, Cl. 148-16.000.

Lake Region Manufacturing Co., Inc.: *See*—
Fleischhacker, Joseph F., Jr., 5,069,217, Cl. 128-657.000.

Lakenmacher, Bodo: *See*—
Bendix, Horst; Hochmuth, Bernd; Johannes, Dieter; Lakenmacher, Bodo; Lausch, Winfried; and Schuebel, Klaus, 5,069,891, Cl. 423-359.000.

Lammek, Bernard: *See*—
Gavras, Haralambos; and Lammek, Bernard, 5,070,187, Cl. 530-315.000.

Lampret, Marija: *See*—
Kovacic, Mateja; Milovac, Jenny; Cvelbar, Polona; Stalc, Anton; Trost, Zvezdana; Kopitar, Zdravko; Kofler, Bojan; Nikolic, Vida; Lampret, Marija; and Lippai, Marija, 5,069,910, Cl. 424-464.000.

Lancet S.A.: *See*—
Yahav, Shimon; and Daar, Yair, 5,070,222, Cl. 219-10.493.

Lange, Gerhard, to WAFIOS Maschinenfabrik GmbH & Co. Kommanditgesellschaft. Positioning device for arranging elongated workpieces and the use of such a device in a wire-working machine. 5,069,059, Cl. 72-421.000.

Langen, Michael: *See*—
Schmid, Karl; Meffert, Alfred; Friedrich, Klaus; Langen, Michael; and Herrmann, Klaus, 5,069,817, Cl. 252-351.000.

Langerbeins, Klaus, to Rohm GmbH. Heteropolymolybdate catalysts and method for oxydehydrogenation. 5,070,061, Cl. 502-211.000.

Lapatovich, Walter P., to GTE Laboratories Incorporated. Electrodless hid lamp with microwave power coupler. 5,070,277, Cl. 315-248.000.

Larac S.p.A.: *See*—
Pizzigoni, Giuseppe; and Parrini, Paolo, 5,069,811, Cl. 252-174.140.

Largman, Theodore; Mares, Frank; and Rodman, Clarke A., to Allied-Signal Inc. Fibers and filters containing said fibers. 5,069,970, Cl. 428-373.000.

Larsen, Kurt H., to Dansk Industri Syndikat A/S. Automatic foundry plant. 5,069,267, Cl. 164-155.000.

Larsen, Oya F.: *See*—
Leisure, Ronald K.; Larsen, Oya F.; and Reger, Ronald K., 5,070,037, Cl. 437-195.000.

Larson, Richard I.; Dada, Abdul G.; and Harmon, John L., to General Electric Company. Process for passivating uranium oxides to control oxidation. 5,069,888, Cl. 423-260.000.

Larson, Roger R. Physical rehabilitation device and method. 5,069,446, Cl. 272-96.000.

Larsson, Arne, to Oxy-Tuben AB. Ignition device for lances. 5,069,616, Cl. 431-267.000.

Lascelles, Martin C.; and Wong, Michael, to International Business Machines Corporation. Simplified CAD parametric macroinstruction capability including variational geometrics feature. 5,070,534, Cl. 395-155.000.

Latham, Geoffrey: *See*—
Singer, Jerome R.; Grunbaum, Francisco A.; Kohn, Philip D.; Zubelli, Jorge P.; Couch, John L.; Naparst, Harold L.; and Latham, Geoffrey, 5,070,455, Cl. 364-413.190.

Latif, Farrukh A.; and Stevens, Michael D., to Unisys Coporation. Port adapter system including a controller for switching channels upon encountering a wait period of data transfer. 5,070,477, Cl. 395-325.000.

Lau, Hon Chung: *See*—
Borchardt, John K.; and Lau, Hon Chung, 5,069,802, Cl. 252-8.554.

Lauer, Robert B.: *See*—
Rideout, William C.; Holmstrom, Roger P.; Eichen, Elliot; Powazinik, William; LaCourse, Joanne; Schlafer, John; and Lauer, Robert B., 5,069,561, Cl. 385-14.000.

Lausch, Winfried: *See*—
Bendix, Horst; Hochmuth, Bernd; Johannes, Dieter; Lakenmacher, Bodo; Lausch, Winfried; and Schuebel, Klaus, 5,069,891, Cl. 423-359.000.

Lavan, Charles K., Jr., to Loral Corporation. Torpedo countermeasures. 5,069,109, Cl. 89-1.110.

Lawson, David F.; and Bryant, Lynn A., to Bridgestone/Firestone, Inc. Adhesively-bonded coated composites of highly saturated elastomers. 5,069,927, Cl. 427-40.000.

Lawter International, Inc.: *See*—
Mueller, Hermann; Hendron, Timothy J.; and Dawood, David, 5,069,596, Cl. 414-607.000.

Lazouni, Adbelkrim: *See*—
Nguyen, Thinh; Lazouni, Adbelkrim; and Doan, Kim S., 5,069,771, Cl. 204-292.000.

Lazzarotti, S. James; Wojtowicz, Edward A.; Mullin, Eugene T.; and Nadel, Jess, to Unisys Corporation. Apparatus and method for automatically and continuously producing a flow of singulated mail flats. 5,069,440, Cl. 271-202.000.

Leadbetter, Michael R.: *See*—
Broadhurst, Michael D.; Cormartie, Thomas H.; Fisher, Karl J.; Haag, William G.; Kanne, David B.; and Leadbetter, Michael R., 5,070,210, Cl. 549-350.000.

Leclercq, Jacques: *See*—
Letemps, Bernard; and Leclercq, Jacques, 5,069,705, Cl. 65-289.000.

Le Comte, Michel L., to JS Telecom. Method and apparatus for reducing noise on a signal encodable on a plurality of predetermined levels. 5,070,516, Cl. 375-102.000.

Lee, Eldon C.; and Gum, Ernest K., to Nestec S.A. Preparation of tea products. 5,069,925, Cl. 426-597.000.

Lee, Milton L.; and Sin, Chung H., to Brigham Young University. Apparatus and methods for trace component analysis. 5,070,240, Cl. 250-288.000.

Lee, Ruojia: *See*—
Cathey, David A.; Tuttle, Mark E.; Lee, Ruojia; and Lowrey, Tyler A., 5,069,747, Cl. 156-643.000.

Lee, Ving J.: *See*—
Murdock, Keith C.; and Lee, Ving J., 5,070,082, Cl. 514-105.000.

Lee, Yuan-Ho, to San Shing Hardware Works Co., Ltd. Punch press with independently operated pressing units driven by a crankshaft. 5,069,057, Cl. 72-405.000.

Leech, Edward J.; and Johnson, Steven M., to Amp-Akzo Corporation; and Haven Corporation. Photoimageable permanent resist. 5,070,002, Cl. 430-325.000.

Lefelar, Judith A.: *See*—
Silverman, David C.; Lefelar, Judith A.; and Kinlen, Patrick J., 5,069,974, Cl. 428-422.000.

Legrady, Janos J.: *See*—
Holden, Homer N.; Loyer, Philip K.; Noyes, Lowell T.; and Legrady, Janos J., 5,069,635, Cl. 439-400.000.

Lehmann, Roger W.; and Statten, Michael I. Pop-out toy. 5,069,650, Cl. 446-476.000.

Leib, Terry K.: *See*—
Lobos, John H.; Leib, Terry K.; and Su, Tah-Mun, 5,070,017, Cl. 435-170.000.

Leichnitz, Kurt; May, Wolfgang; Bather, Wolfgang; and Evers, Wolfgang, to Dragerwerk Aktiengesellschaft. Automated apparatus for detecting gaseous components in air with a colorimetric testing tube. 5,069,879, Cl. 422-86.000.

Leister, Peter, to Deutsche Gesellschaft fur Wiederaufarbeitung von Kernbrennstoffen. Apparatus for the treatment and conveyance of feed sludge. 5,068,978, Cl. 34-57.00A.

Leisure, Ronald K.; Larsen, Oya F.; and Reger, Ronald K., to Delco Electronics Corporation. Integrated circuit interconnect having dual dielectric intermediate layer. 5,070,037, Cl. 437-195.000.

Lek: *See*—
Kovacic, Mateja; Milovac, Jenny; Cvelbar, Polona; Stalc, Anton; Trost, Zvezdana; Kopitar, Zdravko; Kofler, Bojan; Nikolic, Vida; Lampret, Marija; and Lippai, Marija, 5,069,910, Cl. 424-464.000.

Leland Stanford Junior University, The Board of Trustees of the: *See*—
Geballe, Theodore H.; Feigelson, Robert S.; and Gazit, Dan, 5,070,071, Cl. 505-1.000.
Nolan, Garry P.; Fiering, Steven; and Herzenberg, Leonard A., 5,070,012, Cl. 435-6.000.
Peters, Norman K.; Frost, John W.; and Long, Sharon R., 5,070,018, Cl. 435-172.300.
Yin, Hezhu; Harris, Jerry M.; and Nur, Amos M., 5,069,308, Cl. 181-106.000.

Lemke, Stuart H. Stress plate for roof membrane fastener assembly. 5,069,589, Cl. 411-533.000.

Leningradsky Gosudarstvenny Pedagogichesky Institut: *See*—
Morozov, Vyacheslav G.; and Khavinson, Vladimir K., 5,070,076, Cl. 514-21.000.

Lennox Industries Inc.: *See*—
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Lens-O-Matic Inc.: *See*—
Reinson, Lorne R.; Akerman, Mark J.; and Klippenstein, John, 5,069,494, Cl. 294-1.200.

Leonard, David A.: *See*—
Trainor, Robert J., Jr.; Bardo, Samuel B.; and Leonard, David A., 5,069,010, Cl. 52-127.800.

Leone, Massimo; and Paudice, Ciro, to Societa Italiana Vetro - SIV - S.p.A. Method and device for the manufacture of a sealing gasket on the rim of a sheet of glass. 5,069,852, Cl. 264-171.000.

Lepage, Jean-Paul; and Lepage, Robert. Chain lock for carts. 5,069,324, Cl. 194-212.000.

Lepage, Robert: *See*—
Lepage, Jean-Paul; and Lepage, Robert, 5,069,324, Cl. 194-212.000.

Leppard, David G.: *See*—
Braig, Adalbert; Meier, Hans-Rudolf; Leppard, David G.; Wasson, Robert C.; and Phillips, Emyr, 5,069,805, Cl. 252-47.500.
Rody, Jean; and Leppard, David G., 5,070,007, Cl. 430-551.000.

Les Profiles du Centre: *See*—
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Lessi, Carlo: *See*—
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Lesslie, David J.: *See*—
Magnon, Gary D.; Seymour, Raymond K.; Lesslie, David J.; Guerrette, Michael C.; and McKay, Geoffrey H., 5,070,361, Cl. 335-172.000.

Letardi, Tommaso, to ENEA Comitato Nazionale per la Ricerca e per lo Sviluppo dell'Energia Nucleare e Delle Energie Alternative. Transverse discharge excited laser head with three electrodes. 5,070,513, Cl. 372-83.000.

Letemps, Bernard; and Leclercq, Jacques, to Saint-Gobain Vitrage International. Apparatus for cambering glass sheets by elastically bending a shaping roller. 5,069,705, Cl. 65-289.000.

Levenstein, Victor M., to Dresser Industries, Inc. Securing nut apparatus. 5,069,587, Cl. 411-432.000.

Lever Brothers Company: *See*—
Humphreys, Robert W. R.; Harirchian, Bijan; and Smeets, Frans L. M., 5,069,812, Cl. 252-186.440.

Lever Brothers Company, Division of Conopco, Inc.: *See*—
Lagerwaard, Cornelis A.; Cornelissen, Johannes M.; Swarthoff, Ton; Klugkist, Jan; and Thom, David, 5,069,809, Cl. 252-174.120.

Levine, Jules D.; and Jensen, Millard J., to Texas Instruments Incorporated. Production of semiconductor grade silicon spheres from metallurgical grade silicon particles. 5,069,740, Cl. 156-616.200.

Levine, Peter, to Sabel, Inc. Hand-held laminating roller. 5,069,732, Cl. 156-71.000.

Lewis, Arlin C. Method of manufacturing combustible gaseous products. 5,069,765, Cl. 204-173.000.

Lewis, Christopher; and Barton, Robert J., to Siemens Plessey Electronic Systems Limited. Pulse doppler radar systems for helicopter recognition. 5,070,335, Cl. 342-90.000.

Lewis, Dale A.: *See*—
Bacus, Michael W.; Price, Dick T.; Lewis, Dale A.; Demarchi, Michael E.; Homa, Karl L. C.; McInturff, Gary; and Gruell, Robert, 5,070,231, Cl. 219-216.000.

Lewis, Jerome M.: *See*—
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Lewkowicz, Julian: *See*—
Bletscher, Warren L., Jr.; Lewkowicz, Julian; and Tayefeh, Morovat, 5,070,495, Cl. 369-116.000.

Ley, Wilhelm: *See*—
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Leybold Aktiengesellschaft: *See*—
Fritsche, Wolf-Eckhart; Lubbehusen, Michael; Kukla, Reiner; and BeiBwenger, Siegfried, 5,069,772, Cl. 204-298.120.
Hussla, Ingo; and Ritter, Jochen, 5,069,930, Cl. 427-55.000.
Reuter, Wolfgang; and Gediga, Josef, 5,069,269, Cl. 164-325.000.
Schuetz, Guenter; Stueber, Hans-Guenter; and Kinzig, Volker, 5,069,603, Cl. 417-423.400.

Leyrer, Reinhold J.; Neumann, Peter; and Dust, Matthias, to BASF Aktiengesellschaft. Panchromatic electrophotographic recording element containing multiple carrier-producing sensentizers. 5,069,991, Cl. 430-49.000.

Li, James C. M.; and Huang, Der-Ray, to Li, James C. M.; and China Steel Corporation. Method and apparatus of continuous dynamic joule heating to improve magnetic properties and to avoid annealing embrittlement of ferro-magnetic amorphous alloys. 5,069,428, Cl. 266-104.000.

Lia, Raymond A.: *See*—
Salvati, Jon R.; and Lia, Raymond A., 5,070,401, Cl. 358-107.000.

Liang, Dong C.; and Blades, Michael W., to University of British Columbia. Atmospheric pressure capacitively coupled plasma spectral lamp. 5,069,546, Cl. 356-316.000.

Libbey-Owens-Ford Co.: *See*—
Cheng, J. Joseph, 5,069,826, Cl. 252-587.000.

Lidak Pharmaceuticals: *See*—
Katz, David H., 5,070,107, Cl. 514-724.000.

Lidor, Cobi; Dekel, Samuel; Edelstein, Samuel; and Meyer, Michael S., to Yeda Research and Development Company Limited. Method and compositions comprising a vitamin D derivatives for the local treatment of bone fractures. 5,069,905, Cl. 424-423.000.

Liebau, James G.: *See*—
Stein, Jay A.; Plewes, Donald B.; Gershman, Russell J.; Liebau, James G.; and Williams, John N., 5,070,519, Cl. 378-146.000.
Liebel, Henry L. Shipping container. 5,069,359, Cl. 220-441.000.
Lieberman, Daniel, to Comsat. Pay-tv time purchase scheme. 5,070,400, Cl. 358-84.000.
Liebram, Udo: *See*—
Reil, Wilhelm; Deutschbein, Ulrich; and Liebram, Udo, 5,069,021, Cl. 53-563.000.
Lieser, Frank, to Ferro Tools Inc. Universal joint. 5,069,569, Cl. 403-57.000.
Life Technologies, Inc.: *See*—
Cady, David J.; Hall, Kevin R.; and Lynn, Robert W., 5,069,370, Cl. 222-464.000.
Ligorati, Ferdinando: *See*—
Canavesi, Roberto; and Ligorati, Ferdinando, 5,070,062, Cl. 502-225.000.
Lin, Shin-Hsiung. Physiotherapy healthy device. 5,069,207, Cl. 128-366.000.
Lin, Wen-Tsung. Wax-accumulated musical candle. 5,069,617, Cl. 431-253.000.
Lind, Eric; Davis, Pauls; and Gagnon, Steven D., to BASF Corporation. Copolymers of vinyl acetate and allyl glycidyl ether capped C_{12}–C_{30} aliphatic alcohols and their saponified products. 5,070,140, Cl. 525-60.000.
Lindauer Dornier Gesellschaft m.b.H.: *See*—
Krumm, Valentin, 5,069,395, Cl. 242-47.010.
Linder, Karen E., to E. R. Squibb & Sons, Inc. Boronic acid adducts of technetium-^{99m} dioxime-imine complexes. 5,069,900, Cl. 424-1.100.
Lindner, Werner: *See*—
Mehlhorn, Heinz; Schmahl, Gunter; Lindner, Werner; and Haberkorn, Axel, 5,070,091, Cl. 514-242.000.
Lindsey, Vurness T. Dumping trailer. 5,069,507, Cl. 298-11.000.
Linear Technology Corporation: *See*—
Rempfer, William C.; and Dobkin, Robert C., 5,070,259, Cl. 307-350.000.
Liou, Fu-Tai; and Spinner, Charles R., to SGS-Thomson Microelectronics, Inc. Semiconductor contact via structure and method. 5,070,391, Cl. 357-71.000.
Lippai, Marija: *See*—
Kovacic, Mateja; Milovac, Jenny; Cvelbar, Polona; Stalc, Anton; Trost, Zvezdana; Kopitar, Zdravko; Kofler, Bojan; Nikolic, Vida; Lampret, Marija; and Lippai, Marija, 5,069,910, Cl. 424-464.000.
Liu, Ming-de; Bresci, Bruno; Magagnini, Pier L.; Maurizi, Nicoletta; Pedretti, Ugo; and Roggero, Arnaldo, to Eniricerche, S.p.A. Semiaromatic copolyamide or copolyester-amide prepared from aliphatic polyamide. 5,070,155, Cl. 525-432.000.
Lloyd, Robert D.: *See*—
Dworkin, David R.; Lloyd, Robert D.; and Nguyen, Tuan, 5,069,986, Cl. 429-27.000.
Lo, Tsung I. Automobile steering lock. 5,069,048, Cl. 70-209.000.
Lobos, John H.; Leib, Terry K.; and Su, Tah-Mun, to General Electric Company. Method for biodegrading bisphenol alkanes. 5,070,017, Cl. 435-170.000.
Lockheed Corporation: *See*—
Martin, David A., 5,070,232, Cl. 219-390.000.
Lockhoff, Oswald; Goossens, John; Brunner, Helmut; Sperzel, Michael; and Stunkel, Klaus G., to Bayer Aktiengesellschaft. Substituted N-glycosylamides, process for their preparation, and their use as medicaments. 5,070,190, Cl. 536-22.000.
Loctite Corporation: *See*—
Klemarczyk, Philip T.; and Okamoto, Yoshihisa, 5,070,117, Cl. 522-31.000.
Lodewegen, Lloyd E. Apparatus and method of conveying and boxing frozen patties. 5,069,019, Cl. 53-443.000.
Loeffler, Donald E.: *See*—
Rhodes, Robert B.; Eckert, Rudolf J.; and Loeffler, Donald E., 5,070,131, Cl. 524-484.000.
Loffler, Alfons; Marte, Walter; and Wiggermann, Peter, to Zahnradfabrik Friedrichshafen AG. Hydraulic pressure-control device with parallel compression springs. 5,069,111, Cl. 91-516.000.
Long, David J.: *See*—
Oxenrider, Bryce C.; Long, David J.; and Mares, Frank, 5,070,162, Cl. 526-216.000.
Long, Edward A. Motorcycle cleaning aid. 5,069,348, Cl. 211-24.000.
Long, Sharon R.: *See*—
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Loral Corporation: *See*—
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Lorang, Michael J.: *See*—
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Loren, Norman S., to Milad Limited Partnership. Method of injection molding with pressurized-fluid assist. 5,069,859, Cl. 264-572.000.
Lorimer, D'Arcy H.; and Bercaw, Craig A., to Applied Materials, Inc. Method of forming a corrosion-resistant protective coating on aluminum substrate. 5,069,938, Cl. 427-255.100.
Lorimor, Gary D.: *See*—
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Loubet, Marc G.: *See*—
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Lower, William E.; and Mitchell, Stephen C., to Rotex, Inc. Screen deck with pedestal mounted slats. 5,069,778, Cl. 209-323.000.
Lowrey, Tyler A.: *See*—
Cathey, David A.; Tuttle, Mark E.; Lee, Ruojia; and Lowrey, Tyler A., 5,069,747, Cl. 156-643.000.
Loyer, Philip K.: *See*—
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Lubbehusen, Michael: *See*—
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Lubberts, Cor, to Eastman Kodak Company. Recirculating document feeder. 5,069,436, Cl. 271-3.100.
Lucas Industries public limited company: *See*—
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Margetts, Hugh G., 5,069,316, Cl. 188-79.620.
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Luk Lamellen und Kupplungsbau GmbH: *See*—
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Lunsford, David R.: *See*—
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Luo, Lifeng; Sanders, Nicholas A.; and Couch, Richard W., Jr., to Hypertherm, Inc. Proceses and apparatus for reducing electrode wear in a plasma arc torch. 5,070,227, Cl. 219-121.550.
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Lynch, John L.; and Charlot, Lincoln H., Jr., to Security Tag Systems, Inc. Release of pin-clutch mechanism in theft-deterrent device. 5,069,047, Cl. 70-57.100.
Lynn, Dwight D., to ACS Communications, Inc. Time dependant, variable amplitude threshold output circuit for frequency variant and frequency invarient signal discrimination. 5,070,527, Cl. 379-395.000.
Lynn, Robert W.: *See*—
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Lyonnaise des Eaux: *See*—
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Mabuchi Motor Co., Ltd.: *See*—
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Rosengrant, Brent L.; Poss, Glen T.; and Maccabee, Malcolm M., 5,069,469, Cl. 280-288.100.
Macholdt, Hans-Tobias: *See*—
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Machuron-Mandard, Xavier; Madic, Charles; and Koehly, Gerard, to Commissariat a l'Energie Atomique. Process for reducing and dissolving PuO_2. 5,069,827, Cl. 252-626.000.
Mack, David J., to Western Company of North America, The. Fracturing process using carbon dioxide and nitrogen. 5,069,283, Cl. 166-308.000.
MacKendrick, Robert R.; and Gonsalves, Mario, to Air-Lock, Incorporated. Spacesuit sizing system. 5,068,919, Cl. 2-2.10A.
Mackey, Suzanne: *See*—
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Maczulak, Anne: *See*—
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Machuron-Mandard, Xavier; Madic, Charles; and Koehly, Gerard, 5,069,827, Cl. 252-626.000.
Madzgalla, Frank: *See*—
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Madzgalla, Hans-Georg; and Madzgalla, Frank, to Lucas Industries public limited company. Spot type disc brake including an improved hold down spring. 5,069,314, Cl. 188-73.360.
Maehara, Toshifumi, to Akebono Brake Industry Co., Ltd.; and Akebono Research and Development Centre Ltd. Brake hydraulic pressure control apparatus. 5,069,508, Cl. 303-113.0TR.
Maekawa, Hideaki; and Miyoshi, Masanobu, to Konica Corporation. Light-sensitive silver halide photographic material. 5,070,008, Cl. 430-567.000.

Maezawa, Hiroshi: *See*—
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Magnon, Gary D.; Seymour, Raymond K.; Lesslie, David J.; Guerrette, Michael C.; and McKay, Geoffrey H., to General Electric Company. Molded case circuit breaker operating mechanism assembly. 5,070,361, Cl. 335-172.000.
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Mahany, Ronald L.; Sojka, Marvin L.; and West, Guy J., to Norand Corporation. Mobile radio data communication system and method. 5,070,536, Cl. 455-67.000.
Mahoney, Gregory P.; and Benwood, Bruce R., to Eastman Kodak Company. Electrostatographic method and apparatus for producing multicolor duplex reproductions. 5,070,369, Cl. 355-271.000.
Mai, Phuong N. Foot and leg exercise device. 5,069,445, Cl. 272-96.000.
Majid, Abdul; and Ripmeester, John A., to National Research Council of Canada. Inclusion complexes of cyclodextrins by agglomeration. 5,070,081, Cl. 514-58.000.
Makabe, Mitsuru, to Fuji Jukogyo Kabushiki Kaisha. Control system for a clutch of a motor vehicle. 5,069,319, Cl. 192-0.052.
Makarowski, Anthony, to Insul-Lite Window Manufacturing, Inc. Pivotable window sash assembly. 5,069,001, Cl. 49-176.000.
Makio, Yusuke: *See*—
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Malecek, Edward L.; and Ramberg, Charles H., to Arctic Fox Heaters, Inc. Fluid dam and pressure tester apparatus and method of use. 5,069,062, Cl. 73-49.700.
Malewicz, Andrzej M., to Rollerblade. In-line roller skate fastening system and method of assembling the same. 5,068,956, Cl. 29-437.000.
Malhi, Satwinder: *See*—
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Mallas, Angelos, to MALL Tooling and Engineering. Push rod having irregularly shaped internal bore. 5,069,173, Cl. 123-90.610.
Malone, Thomas C., to Warner-Lambert Company. Tetracyclic amines useful as cerebrovascular agents. 5,070,093, Cl. 514-284.000.
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Mannesmann Aktiengesellschaft: *See*—
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Mano, Hiroshi, to Kabushiki Kaisha Toshiba. Telephone system. 5,070,524, Cl. 379-165.000.
Mantel, Juval. Sonic direction locating system. 5,070,484, Cl. 367-124.000.
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Marcus, Michael A.; and Graff, Ernest A., to Eastman Kodak Company. Capacitance probe for measuring a width of a clearance between parts. 5,070,302, Cl. 324-662.000.
Marentic, Francis J.; and Morris, Terry L., to Minnesota Mining and Manufacturing Company. Drag reduction article. 5,069,403, Cl. 244-130.000.
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Oxenrider, Bryce C.; Long, David J.; and Mares, Frank, 5,070,162, Cl. 526-216.000.
Marescot, Jean-Marc D. L.; and Soulier, Pascal-Marie P. M., to Societe anonyme dite Hispano-Suiza. Locking hinge assembly for an aircraft cowling. 5,068,946, Cl. 16-333.000.
Margetts, Hugh G., to Lucas Industries Public Limited Company. Brake actuator with adjuster. 5,069,316, Cl. 188-79.620.
Margolis, David J., to University of Pennsylvania, Trustees of the. Methods of treating osteoporosis, increasing bone mineral content and preventing the occurrence of compression fractures in a mammal. 5,070,108, Cl. 514-725.000.
Marhold, Albrecht: *See*—
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Markham, Richard G., to Oxycal Laboratories, Inc. Compositions and methods for administering therapeutically active compounds. 5,070,085, Cl. 514-161.000.
Markle, Jerry A. Stackable recycling storage bin apparatus. 5,069,343, Cl. 206-508.000.
Marks, Lloyd A. Pivotable joint and joint locking mechanism for a foldable frame. 5,069,238, Cl. 135-109.000.
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Marquez, Al H.; Way, James A.; and Remelman, G. Mark, to Hot Snacks, Inc. Apparatus for frying foods. 5,069,116, Cl. 99-330.000.
Mars, Suzanne P. Upright eating utensil for the physically disabled. 5,068,967, Cl. 30-324.000.
Marschall, Klaus W. Frequency-to-digital converter using a combined counted and time method. 5,070,333, Cl. 341-157.000.
Marsh, John F.; and Swietlik, Joseph M., to Exxon Research & Engineering. Lubricating oil additives. 5,069,804, Cl. 252-42.700.
Marshall, Daniel R.; Campbell, David K.; Bell, Bernard W., Jr.; and Towner, David K., to Hewlett-Packard Company. Wedge prism assembly for optical information storage. 5,070,493, Cl. 369-112.000.
Marshall, Francis G., to Bridgeport Metal Goods Mfg. Co., The. Pen-size flashlight. 5,070,438, Cl. 362-206.000.
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Martel, Alain. Light color and intensity modulation system. 5,070,399, Cl. 358-81.000.
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Martin, Bobby R.: *See*—
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Martin, David A., to Lockheed Corporation. Optical coating pyrolizer. 5,070,232, Cl. 219-390.000.
Martin, John M. Means for reducing the criminal usefulness of dischargeable hand weapons. 5,068,989, Cl. 42-70.010.
Martin, Patrick S., to General Cryogenics Incorporated. Carbon dioxide refrigeration system. 5,069,039, Cl. 62-50.300.
Martinez, Juan J. Portable, collapsible multi-purpose chair. 5,069,503, Cl. 297-54.000.
Martwick, Wilford E., to Honeywell Inc. Cased telescoped ammunition round. 5,069,137, Cl. 102-434.000.
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Marzocco, Alessandro, to Luigi Franchi S.p.A. Trigger mechanism for smooth-bore firearms. 5,068,990, Cl. 42-70.040.

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Masaki, Mitsuo; Yamakawa, Tomio; Satoh, Masaru; Takeda, Hiromitsu; Yoshino, Yasushi; and Matsukura, Hitoshi, to Nippon Chemiphar Co., Ltd. Therapeutic agent for liver disease and piperazine derivatives. 5,070,089, Cl. 514-255.000.
Masaki, Mitsuo; Satoh, Masaru; Moritoh, Naoya; Hashimoto, Koichi; Kamishiro, Toshiro; and Shinozaki, Haruhiko, to Nippon Chemiphar Co., Ltd. Alkylenediamine derivatives. 5,070,196, Cl. 540-450.000.
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Masi, Francesco; Moalli, Angelo; Invernizzi, Renzo; Menconi, Francesco; Ferrero, Cesare; Malquori, Stefano; Barazzoni, Lia; and Polesello, Mario, to Enichem Anic S.p.A. Catalyst component and catalyst for the production of very high molecular weight polyolefins. 5,070,051, Cl. 502-9.000.
Mason, Jack A., to Mason, Susan P. Document supporting apparatus. 5,068,988, Cl. 40-514.000.
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Wong, Ngai C., 5,070,260, Cl. 359-330.000.
Massaro, Bruno A., to Massaro, Bruno A.; Tolisano, Thomas; and Bolden, Hank. Replacement seat for sanitary chairs. 5,068,927, Cl. 4-480.000.
Masterson, Joseph G., to Elan Corporation, PLC. Method of using nicotine in the treatment of conditions susceptible to said treatment. 5,069,904, Cl. 424-401.000.
Masuda, Shun: *See*—
Kato, Akira; Nishikawa, Takafumi; and Masuda, Shun, 5,069,187, Cl. 173-492.000.
Matczak, Joseph A.; and Matczak, Stanley E., to Seals-It, Inc. Rod end assembly. 5,069,571, Cl. 403-134.000.
Matczak, Stanley E.: *See*—
Matczak, Joseph A.; and Matczak, Stanley E., 5,069,571, Cl. 403-134.000.
Mathews, Ronald J.: *See*—
Woodings, Robert T.; and Mathews, Ronald J., 5,069,430, Cl. 266-271.000.
Mathews, Thomas P.: *See*—
Axelson, Eric T.; and Mathews, Thomas P., 5,069,136, Cl. 102-425.000.
Mathivat, Denis: *See*—
Boutier, Philippe; Petit-Collin, Jean-Marc; Plebani, Dany-Ange; Mathivat, Denis; and Machura, Christophe, 5,069,704, Cl. 65-106.000.
Matonte, Philip J., to Progress Water Technologies Corp. Device for continuous contacting of liquids and solids. 5,069,883, Cl. 422-269.000.
Matre, Vigbjorn. Collapsible table. 5,069,142, Cl. 108-42.000.
Matschke, Gunter: *See*—
Krafft, Werner; Helling, Gunter; and Matschke, Gunter, 5,070,006, Cl. 430-531.000.
Matsuda, Atsuko; and Goto, Narito, to Konica Corporation. Magnetic recording medium. 5,069,949, Cl. 428-141.000.
Matsuda, Yasuhiko, to Kabushiki Kaisha Sato. Continuous paper autoloading mechanism for thermal printer. 5,069,562, Cl. 400-120.000.
Matsui, Hiroshi: *See*—
Ishihara, Yukihiro; Yamamoto, Tamotsu; and Matsui, Hiroshi, 5,070,238, Cl. 250-231.130.
Matsui, Tetsuya; Kitamori, Takehiko; Yokose, Kenji; and Sakagami, Masaharu, to Hitachi, Ltd. Apparatus for measuring breakdown plasma. 5,070,300, Cl. 324-464.000.
Matsukura, Hitoshi: *See*—
Masaki, Mitsuo; Yamakawa, Tomio; Satoh, Masaru; Takeda, Hiromitsu; Yoshino, Yasushi; and Matsukura, Hitoshi, 5,070,089, Cl. 514-255.000.
Matsumoto, Akio: *See*—
Ito, Haruyuki; and Matsumoto, Akio, 5,069,609, Cl. 425-84.000.
Matsumoto, Eiichi; and Aruga, Tatsuo, to Nissan Motor Company, Ltd. Internal combustion engine with crankcase ventilation system. 5,069,192, Cl. 123-572.000.
Matsumoto, Hiroaki, to Canon Kabushiki Kaisha. Image reading apparatus having a low friction member between the conveying roller and the transparent plate. 5,070,415, Cl. 353-482.000.
Matsumoto, Kazumi: *See*—
Katayama, Shigeru; Tominaga, Kaoru; Suetsugu, Toshio; and Matsumoto, Kazumi, 5,070,041, Cl. 437-214.000.
Matsunaga, Daisaku: *See*—
Nakada, Hitoshi; Wakimoto, Takeo; Shinkai, Masanao; and Matsunaga, Daisaku, 5,069,975, Cl. 428-457.000.
Matsunaga, Eiju: *See*—
Tsutsumi, Yasuhiro; Yokoya, Yuji; Hara, Yoshimichi; Matsunaga, Eiju; Kawata, Hiroyuki; Fukami, Akira; and Suzuki, Yutaka, 5,069,476, Cl. 280-707.000.
Matsuno, Yuji; Kido, Yoshinobu; and Sugiyama, Yoshiharu, to Mazda Motor Corporation. Control system for an automatic transmission in an automotive vehicle. 5,069,084, Cl. 74-844.000.
Matsuoka, Shinji: *See*—
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Matsushita Electric Industrial Co., Ltd.: *See*—
Ishihara, Yukihiro; Yamamoto, Tamotsu; and Matsui, Hiroshi, 5,070,238, Cl. 250-231.130.
Kimura, Tadashi; and Ikeda, Tanejiro, 5,069,746, Cl. 156-633.000.
Mito, Yoshio; Kitagawa, Masatoshi; Hirao, Takashi; Yasuno, Yoshitake; and Hirano, Ryuma, 5,070,027, Cl. 437-15.000.
Matsushita, Tsukasa: *See*—
Kumamoto, Hidechika; and Matsushita, Tsukasa, 5,070,412, Cl. 358-451.000.
Matsutani, Kanji; and Fukuda, Masatoshi, to Matsutani Seisakusho Co., Ltd. Dental handpiece. 5,069,620, Cl. 433-82.000.
Matsutani Seisakusho Co., Ltd.: *See*—
Matsutani, Kanji; and Fukuda, Masatoshi, 5,069,620, Cl. 433-82.000.
Matsuura, Ichiro: *See*—
Mori, Masami; Yanagishita, Norio; Matsuura, Ichiro; Ishimaru, Kiichiro; and Mizuno, Hisayoshi, 5,069,838, Cl. 264-46.600.
Mattiazzi, Joseph A.: *See*—
Westberg, Tom; and Mattiazzi, Joseph A., 5,069,643, Cl. 440-77.000.
Mattson, Brian J.; and Edwards, Chester N., to Micron Technology, Inc. Stacked and cross-connected recirculating fans in a semiconductor manufacturing cleanroom. 5,069,113, Cl. 454-252.000.
Matuszak, John J., to Sonoco Products Company. Easy-opening composite closure for hermetic sealing of a packaging container by double seaming. 5,069,355, Cl. 220-270.000.
Maurizi, Nicoletta: *See*—
Liu, Ming-de; Bresci, Bruno; Magagnini, Pier L.; Maurizi, Nicoletta; Pedretti, Ugo; and Roggero, Arnaldo, 5,070,155, Cl. 525-432.000.
Mauthe, Peter, to Hilti Aktiengesellschaft. Container having components in sealable blind bores for anchoring fastening element. 5,069,336, Cl. 206-219.000.
MaxiMed Corporation: *See*—
Cohen, Robert S.; Pierce, James M.; and Kinsey, William H., 5,069,906, Cl. 424-430.000.
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Biswas, Jaydeep; Maxwell, Ian E.; and Van Der Eijk, Johan M., 5,069,776, Cl. 208-120.000.
May, Wolfgang: *See*—
Leichnitz, Kurt; May, Wolfgang; Bather, Wolfgang; and Evers, Wolfgang, 5,069,879, Cl. 422-86.000.
Mazda Motor Corporation: *See*—
Izumi, Tomoji; Fujita, Nagahisa; and Ito, Yuichi, 5,070,258, Cl. 307-303.000.
Kageyama, Fumio, 5,069,302, Cl. 180-197.000.
Matsuno, Yuji; Kido, Yoshinobu; and Sugiyama, Yoshiharu, 5,069,084, Cl. 74-844.000.
Nakatani, Shigeki; and Idemoto, Takahiro, 5,069,266, Cl. 164-112.000.
Nobumoto, Kazutoshi; Tsuyama, Toshiaki; Onaka, Toru; and Tsukahara, Yutaka, 5,070,461, Cl. 364-426.030.
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Mazurek, Richard: *See*—
Herrin, Melvin B.; and Mazurek, Richard, 5,069,334, Cl. 206-45.340.
McBrien, Gregory J.; Martin, Anthony N.; and Modeen, Douglas P., to United Technologies Corporation. Vibration monitoring in the frequency domain with a capacitive accelerometer. 5,069,071, Cl. 73-654.000.
McClelland, John F.; and Jones, Roger W., to Iowa State University Research Foundation, Inc. Apparatus and method for transient thermal infrared spectrometry. 5,070,242, Cl. 250-339.000.
McClintock, Jack M.; and Knittel, Gerald H., to Morgan Adhesives Co. Pressure sensitive adhesive tape with central release liner. 5,069,969, Cl. 428-36.500.
McCollum, John L.; and Chen, Shih-Ou, to Actel Corporation. Electrically programmable antifuse element incorporating a dielectric and amorphous silicon interlayer. 5,070,384, Cl. 357-51.000.
McDonald, Lewis D., Jr. Respiration sensor set. 5,069,222, Cl. 128-724.000.
McDonnell Douglas Corporation: *See*—
Kulesha, Richard L.; Jones, Michael D.; and Schmitt, Thomas E., 5,069,318, Cl. 188-377.000.
McElroy, Howard J., to Met-Coil Systems Corporation. Duct joining system. 5,069,484, Cl. 285-39.000.
McGarvey, Glenn W., to Risdon Corporation. Method and assembly for retaining a mounting cup with a sealing collar. 5,069,369, Cl. 222-321.000.
McGill, Shane R. Dispensing apparatus. 5,069,364, Cl. 222-95.000.
McHugh, Charles O.: *See*—
Schmatz, Duane J.; Badgley, John S.; and McHugh, Charles O., 5,069,092, Cl. 82-1.110.

McInturff, Gary: *See*—
Bacus, Michael W.; Price, Dick T.; Lewis, Dale A.; Demarchi, Michael E.; Homa, Karl L. C.; McInturff, Gary; and Gruell, Robert, 5,070,231, Cl. 219-216.000.

McKay, Geoffrey H.: *See*—
Magnon, Gary D.; Seymour, Raymond K.; Lesslie, David J.; Guerrette, Michael C.; and McKay, Geoffrey H., 5,070,361, Cl. 335-172.000.

McKee, Clyde E. Mount for a support bracket. 5,069,410, Cl. 248-475.100.

McKee, L. Michael; Scranton, Joseph D.; Brookey, Robert L.; Gurley, Derrel; and Sodich, Ernie, to Dowell Schlumberger Incorporated. Gravel packer and service tool. 5,069,280, Cl. 166-278.000.

McKinnon, Gordon. Process for covering a substrate with a cementitious surface having a mottled, speckled appearance. 5,069,939, Cl. 427-262.000.

McLean Midwest Corporation: *See*—
Thielman, David E.; Welch, Dennis E.; and Bezat, Theodore P., 5,069,041, Cl. 62-263.000.

McQueen, Joe C., Jr.: *See*—
Gray, Kenneth W., 5,069,284, Cl. 166-311.000.

McRae, Donald A., to Georgetown University. Method of evaluating tissue changes resulting from therapeutic hyperthermia. 5,069,223, Cl. 128-734.000.

Mead Corporation, The: *See*—
Schwab, Gerhart, 5,069,831, Cl. 264-4.330.

Mears, Denis P. Device for lifting boards. 5,069,495, Cl. 294-15.000.

Mechalas, Emmanuel. Adjustable mounting assembly for electric motors. 5,069,415, Cl. 248-674.000.

Medical Engineering and Development Institute, Inc.: *See*—
Fearnot, Neal E.; and Sisken, Richard B., 5,069,674, Cl. 604-282.000.

Medina, Victor; Stracher, Alfred; and Kesner, Leo, to Protor Co. Hypoglycemic and growth-promoting polypeptides isolated from bacitracin. 5,070,074, Cl. 514-3.000.

Medrow, Ronald K.: *See*—
Keyser, William L.; Medrow, Ronald K.; and Milling, Thomas E., 5,069,917, Cl. 426-243.000.

Medtronic, Inc.: *See*—
Grandjean, Pierre-Andre, 5,069,680, Cl. 623-3.000.

Meffert, Alfred: *See*—
Schmid, Karl; Meffert, Alfred; Friedrich, Klaus; Langen, Michael; and Herrmann, Klaus, 5,069,817, Cl. 252-351.000.

Mehlhorn, Heinz; Schmahl, Gunter; Lindner, Werner; and Haberkorn, Axel, to Bayer Aktiengesellschaft. Substituted 1,2,4-triazinediones useful against protozoa in insects. 5,070,091, Cl. 514-242.000.

Mehta, Rai J.: *See*—
Sherba, Samuel E.; and Mehta, Rai J., 5,069,717, Cl. 106-18.350.

Meier, Hans-Rudolf: *See*—
Braig, Adalbert; Meier, Hans-Rudolf; Leppard, David G.; Wasson, Robert C.; and Phillips, Emyr, 5,069,805, Cl. 252-47.500.

Mejias, Andre , to Premiere De Tabbah SA. Piece of jewelry. 5,069,045, Cl. 63-3.000.

Melhus, Ulf: *See*—
Johansson, Sven-Eric; Melhus, Ulf; and Selin, Lennart, 5,069,135, Cl. 102-380.000.

Mellencamp, Mark W.: *See*—
Jones, Elaine V.; Mellencamp, Mark W.; and Miller, Timothy J., 5,069,901, Cl. 424-89.000.

Meloni, Stefano; and Rossi, Carlo, to Enea - Comitato Nazionale per la Ricerca e per lo Sviluppo Dell'Energia Nucleare e Delle Energie Alternative. Device for the activation of perborate in washing machines. 5,068,937, Cl. 8-158.000.

Membrane Technology & Research, Inc.: *See*—
Baker, Richard W.; and Wijmans, Johannes G., 5,069,686, Cl. 55-16.000.
Kaschemekat, Jurgen; Baker, Richard W.; and Wijmans, Johannes G., 5,069,793, Cl. 210-640.000.

Memmi, Massimo: *See*—
Colaiacovo, Ferdinando; Derchi, Domenico; and Memmi, Massimo, 5,069,966, Cl. 428-336.000.

Memtec America Corporation: *See*—
Wrasidlo, Wolfgang J., 5,069,945, Cl. 427-245.000.

Menchel, Jehoshua; and Menchel, Malka. Applicator for liquid eye preparations. 5,069,675, Cl. 604-295.000.

Menchel, Malka: *See*—
Menchel, Jehoshua; and Menchel, Malka, 5,069,675, Cl. 604-295.000.

Menck, Thomas W. Impact buffering recoil mechanism. 5,069,110, Cl. 89-198.000.

Menconi, Francesco: *See*—
Masi, Francesco; Moalli, Angelo; Invernizzi, Renzo; Menconi, Francesco; Ferrero, Cesare; Malquori, Stefano; Barazzoni, Lia; and Polesello, Mario, 5,070,051, Cl. 502-9.000.

Mercedes-Benz AG: *See*—
Kramer, Johann; and Renz, Rainer, 5,069,179, Cl. 123-270.000.

Merck & Co., Inc.: *See*—
Hughes, David L.; Reider, Paul J.; Amato, Joseph S.; Bergan, James J.; and Grabowski, Edward J. J., 5,070,022, Cl. 435-280.000.
Petuch, Brian R.; Chen, Shieh-Shung T.; Inamine, Edward S.; and White, Raymond F., 5,070,015, Cl. 435-42.000.

Messner, Casper O. H. Device suitable for producing a thermal flow inside a thermal integral block. 5,069,199, Cl. 126-400.000.

Met-Coil Systems Corporation: *See*—
McElroy, Howard J., 5,069,484, Cl. 285-39.000.

Metalform Safeset AB: *See*—
Falk, Curt, 5,069,320, Cl. 192-56.00R.

Metsa-Serla Oy: *See*—
Baumann, Manfred, 5,069,378, Cl. 225-1.000.

Metz, Bernd: *See*—
Baucke, Friedrich G. K.; Braun, Jutta; and Metz, Bernd, 5,069,535, Cl. 359-273.000.

Metzger, William T.: *See*—
Jadvar, Hossein; and Metzger, William T., 5,069,215, Cl. 128-642.000.

Metzinger, Friedrich, to Filztuchverwaltungs GmbH. Device for the insertion of filling wires into a wire jointed-band. 5,068,960, Cl. 29-779.000.

Meuschke, Robert E.; Harper, Mark J.; and Stefko, David J., to Westinghouse Electric Corp. Dual winch nuclear fuel transfer system providing more reliable fuel transfer during refueling operations. 5,069,863, Cl. 376-270.000.

Meusel, Otto; Burger, Josef; Deinhardt, Gunther; and Schirbl, Reinhard, to Siemens Aktiengesellschaft. Electrical installation composed of individual subassemblies. 5,070,430, Cl. 361-407.000.

Meyer, Michael S.: *See*—
Lidor, Cobi; Dekel, Samuel; Edelstein, Samuel; and Meyer, Michael S., 5,069,905, Cl. 424-423.000.

Meyer, Norbert; Shirmer, Ulrich; Plath, Peter; Wuerzer, Bruno; and Westphalen, Karl-Otto, to BASF Aktiengesellschaft. Pyrimido(5,4-e)-as-triazine-5,7(6H,8H)-diones. 5,069,708, Cl. 71-90.000.

Meyer, Norbert: *See*—
Westphalen, Karl-Otto; Hamprecht, Gerhard; Wuerzer, Bruno; and Meyer, Norbert, 5,069,710, Cl. 71-92.000.

Meyers, Mark M., to Eastman Kodak Company. Surface emitting, low threshold (SELTH) laser diode. 5,070,509, Cl. 372-45.000.

Miba Sintermetall Aktiengesellschaft: *See*—
Zengin, Osman Z., 5,069,867, Cl. 419-15.000.

Miccoli, Pietro; and Decorte , Enio, to CRC-Compagnia di Ricerca Chimica S.p.A. Pharmaceutical compositions containing cytidine monophosphate of 5-acetamido-3-, 5-D-deoxy-D-glycero-D-galacto-nonulosamic acid. 5,070,079, Cl. 514-51.000.

Michel, Philippe: *See*—
Penven, Paul; Michel, Philippe; Jerome, Denis; and Moradpour, Alexandre, 5,070,214, Cl. 556-64.000.

Micron Technology, Inc.: *See*—
Cathey, David A.; Tuttle, Mark E.; Lee, Ruojia; and Lowrey, Tyler A., 5,069,747, Cl. 156-643.000.
Fogal, Rich; King, Jerrold L.; and Moden, Walter L., 5,070,042, Cl. 437-220.000.
Mattson, Brian J.; and Edwards, Chester N., 5,069,113, Cl. 454-252.000.
Sandhu, Gurtej S.; Schultz, Laurence D.; and Doan, Trung T., 5,069,002, Cl. 51-165.00R.

Mikeska, Felix, to Jean Walterscheid GmbH. Connection between two components. 5,069,574, Cl. 403-274.000.

Milad Limited Partnership: *See*—
Hendry, James W., 5,069,858, Cl. 264-572.000.
Loren, Norman S., 5,069,859, Cl. 264-572.000.

Milberger, Walter E.; Kerfoot, Charles S.; and Jones, Franklin B., to United States of America, Air Force. Wide band domino effect high voltage regulator. 5,070,538, Cl. 455-126.000.

Milburn, Virgil E. Drywall finishing tool adapter. 5,069,610, Cl. 425-87.000.

Miles Inc.: *See*—
Fossati, Piero; Heidenreich, Holger; Hugl, Herbert; and Wehling, Klaus, 5,070,198, Cl. 544-182.000.

Millar, John G. Method and apparatus for anesthetizing caught fish. 5,068,993, Cl. 43-4.000.

Miller, James R.: *See*—
Ingolia, Thomas D.; Kovacevic, Steven; Miller, James R.; and Skatrud, Paul L., 5,070,020, Cl. 435-183.000.

Miller, John M.: *See*—
Patil, Prabhakar B.; Miller, John M.; and Masrur, Md. A., 5,070,284, Cl. 318-362.000.

Miller, Kenneth J.: *See*—
Misiak, Richard J.; and Miller, Kenneth J., 5,069,382, Cl. 228-146.000.

Miller, Rodney L.: *See*—
Sullivan, James R.; Miller, Rodney L.; and Wetzel, Thomas J., 5,070,413, Cl. 358-456.000.

Miller, Steven L.; Wathen, Ronald L.; and Palazzo, Raymond E., Jr., to Environmental Water Technology, Inc. Fluid purifying apparatus and method of purifying fluids. 5,069,785, Cl. 210-232.000.

Miller, Timothy J.: *See*—
Jones, Elaine V.; Mellencamp, Mark W.; and Miller, Timothy J., 5,069,901, Cl. 424-89.000.

Miller, William; and Pulwer, Mitchell J., to Monsanto Company. Process for preparation of fluoromethyl-substituted pyridine dicarboxylates. 5,070,204, Cl. 546-321.000.

Miller, William H., to GenCorp Inc. Method of configuring extrudate flowing from an extruder die assembly. 5,069,853, Cl. 264-176.100.

Millers, Miervaldis: *See*—
Zillgitt, Ulrich; Speer, Harald; Haug, Kurt; Ebinger, Georg; Millers, Miervaldis; and Hasselmann, Heinrich, 5,070,433, Cl. 362-66.000.

Milliken Research Corporation: *See*—
Burns, Alonzo M., Jr., 5,069,958, Cl. 428-246.000.
Reynolds, James R., 5,069,735, Cl. 156-497.000.

Milling, Thomas E.: *See*—
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Milmas AB: *See*—
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Milovac, Jenny: *See*—
Kovacic, Mateja; Milovac, Jenny; Cvelbar, Polona; Stalc, Anton; Trost, Zvezdana; Kopitar, Zdravko; Kofler, Bojan; Nikolic, Vida; Lampret, Marija; and Lippai, Marija, 5,069,910, Cl. 424-464.000.
Min, Taeik; and Touhsaent, Robert E., to Mobil Oil Corporation. Cold sealable cohesive terpolymers. 5,070,164, Cl. 526-286.000.
Minamibata, Yukimitsu: *See*—
Kojima, Takao; and Minamibata, Yukimitsu, 5,069,425, Cl. 251-359.000.
Ministry of International Trade & Industry: *See*—
Sato, Masa-aki; and Yamauchi, Aizo, 5,069,823, Cl. 252-518.000.
Minnesota Mining and Manufacturing Company: *See*—
Brandt, Konrad, 5,069,625, Cl. 439-404.000.
Buerli, Richard, 5,069,544, Cl. 356-73.100.
Marentic, Francis J.; and Morris, Terry L., 5,069,403, Cl. 244-130.000.
Ohkubo, Takatoshi, 5,069,807, Cl. 252-62.540.
Pesce, Sergio, 5,070,248, Cl. 250-483.100.
Tolliver, Howard R.; Bailey, Terry R.; and Bergeson, David L., 5,069,964, Cl. 428-325.000.
Minolta Camera Kabushiki Kaisha: *See*—
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Ishii, Noriyuki; Hirano, Masayasu; Kajita, Hideo; Kuroda, Hirokazu; Izumi, Shuji; Fujino, Akihiko; Ishimura, Toshihiko; and Seki, Reiji, 5,070,234, Cl. 235-441.000.
Ito, Masazumi; and Utsunomiya, Yoichi, 5,070,363, Cl. 355-206.000.
Noda, Takashi, 5,070,362, Cl. 355-206.000.
Mir, Jose M.; Agostinelli, John A.; Peterson, David L.; Paz-Pujalt, Gustavo R.; Higberg, Brian J.; and Rajeswaran, Gopalan, to Eastman Kodak Company. Conductive articles and processes for their preparation. 5,070,072, Cl. 505-1.000.
Mirkin, Jose A.: *See*—
Baldwin, David P.; Du Toit, Stephanus F.; and Mirkin, Jose A., 5,069,501, Cl. 296-223.000.
Misiak, Richard J.; and Miller, Kenneth J., to Solar Turbines Incorporated. Apparatus and method for producing a pressure vessel from metal tubing. 5,069,382, Cl. 228-146.000.
Misra, Chanakya, to Aluminum Company of America. Crystalline aluminum phosphorus compounds. 5,069,889, Cl. 423-306.000.
Mita, Akira: *See*—
Kishikawa, Nobutaka; Mita, Akira; and Satou, Mitsugi, 5,069,953, Cl. 428-201.000.
Mita Indusatrial Co., Ltd.: *See*—
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Mitchell, Stephen C.: *See*—
Lower, William E.; and Mitchell, Stephen C., 5,069,778, Cl. 209-323.000.
Mito, Yoshio; Kitagawa, Masatoshi; Hirao, Takashi; Yasuno, Yoshitake; and Hirano, Ryuma, to Matsushita Electric Industrial Co., Ltd. Method of forming a heterostructure diode. 5,070,027, Cl. 437-15.000.
Mitsubishi Denki K.K.: *See*—
Morikane, Hiroyuki, 5,070,270, Cl. 310-239.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
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Ikeda, Tatsuhiko; Sugahara, Kazuyuki; Kusunoki, Shigeru; and Nishioka, Kyusaku, 5,070,030, Cl. 437-31.000.
Inumochi, Mitsuo, 5,070,425, Cl. 360-135.000.
Kako, Hajime, 5,069,182, Cl. 123-418.000.
Kunikiyo, Tatsuya; Fujinaga, Masato; and Kotani, Norihiko, 5,070,469, Cl. 364-578.000.
Murano, Katsuaki; Yamashita, Yoshinori; Hirano, Sadayuki; Tatsumi, Takumi; and Yamamoto, Hiroaki, 5,069,086, Cl. 74-866.000.
Nakajima, Takashi; Yugi, Akira; and Iwase, Shinichi, 5,069,979, Cl. 428-644.000.
Ogawa, Masaharu; Nakajima, Yoshiki; Ito, Osamu; Furukawa, Teruo; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Ototake, Masafumi; and Ozaki, Minoru, 5,070,492, Cl. 369-47.000.
Ohuchida, Hirofumi; Gofuku, Eishi; Takasago, Hayato; Ishizu, Akira; Tobita, Toshio; and Takada, Mitsuyuki, 5,069,745, Cl. 156-630.000.
Suzuki, Junji; and Kawano, Tsutomu, 5,070,398, Cl. 358-37.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Saito, Masao; Tsukahara, Kengo; Takahashi, Noriko; and Onda, Yuzi, 5,070,059, Cl. 502-206.000.
Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Togai, Kazuhide; Danno, Yoshiaki; Yoshida, Masato; Shimada, Makoto; and Ueda, Katsunori, 5,069,181, Cl. 123-399.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Niinomi, Toshihiko; Funakoshi, Ryohei; Kaseda, Shigeru; and Takahashi, Koichi, 5,070,468, Cl. 364-550.000.
Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Kida, Michio; and Sahira, Kensho, 5,069,741, Cl. 156-617.100.
Mitsui-Cyanamid, Ltd.: *See*—
Tamura, Akira; Watanabe, Naotaka; Fujiyoshi, Hitoshi; and Shirota, Masako, 5,069,721, Cl. 106-724.000.
Watababe, Naotaka; Arai, Takao; Fujiyoshi, Hitoshi; and Shirota, Masako, 5,069,754, Cl. 162-168.200.
Mitsui Petrochemical Industries, Ltd.: *See*—
Katayama, Shigeru; Tominaga, Kaoru; Suetsugu, Toshio; and Matsumoto, Kazumi, 5,070,041, Cl. 437-214.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Saruwatari, Masumi; Tsuji, Syoichi; and Fujii, Yasuhiro, 5,069,848, Cl. 264-118.000.
Mitsuya, Hiroaki: *See*—
Hoofnagle, Jay H.; Broder, Samuel; Mitsuya, Hiroaki; and Yarchoan, Robert, 5,070,077, Cl. 514-45.000.
Mitutoyo Corporation: *See*—
Kuwabara, Yoshiharu; and Suzuki, Masamichi, 5,069,550, Cl. 356-383.000.
Mixon, Grover C.; and Morrison, Willard L., to Phoenix Medical Technology. Surgical drape having incorporated therein a broad spectrum antimicrobial agent. 5,069,907, Cl. 424-445.000.
Miyadera, Shunichi; and Aoki, Harumi, to Asahi Kogaku Kogyo Kabushiki Kaisha. Liquid crystal display device with display holding device. 5,070,409, Cl. 358-241.000.
Miyagishi, Tetsuya; Abe, Toru; and Kuroiwa, Takaaki, to Yamatake-Honeywell Co., Ltd. Moisture-sensitive element for moisture sensors. 5,069,069, Cl. 73-335.000.
Miyaji, Fumio, to Sony Corporation. Static random access memory. 5,070,482, Cl. 365-230.060.
Miyajima, Tooru, to Kyoritsu Yuki Co., Ltd. High water-absorptive resin emulsion. 5,070,133, Cl. 524-501.000.
Miyake, Hiroyuki, to Fuji Xerox Co., Ltd. Image sensor with load capacitors formed from common and individual electrodes. 5,070,236, Cl. 250-208.100.
Miyaki, Yoshiyuki: *See*—
Iwata, Hiroo; Miyaki, Yoshiyuki; and Nakamura, Hiroaki, 5,069,926, Cl. 427-40.000.
Miyano, Yasuo: *See*—
Yamauchi, Kiyoshi; Kugo, Takahiro; and Miyano, Yasuo, 5,069,226, Cl. 128-772.000.
Miyazaki, Masaharu: *See*—
Kobayashi, Seiji; and Miyazaki, Masaharu, 5,069,644, Cl. 440-77.000.
Miyazaki, Shinji; and Tsunashima, Yoshitaka, to Kabushiki Kaisha Toshiba. Liquid source container device. 5,069,244, Cl. 137-209.000.
Miyoshi, Masanobu: *See*—
Maekawa, Hideaki; and Miyoshi, Masanobu, 5,070,008, Cl. 430-567.000.
Mizuguchi, Ryuzo: *See*—
Tsuboniwa, Noriyuki; Urano, Satoshi; and Mizuguchi, Ryuzo, 5,070,167, Cl. 526-301.000.
Mizuhara, Howard, to GTE Products Corporation. Brazed composite having interlayer of expanded metal. 5,069,978, Cl. 428-594.000.
Mizukami, Hiroshi; and Fukutake, Heiji, to Kabushiki Kaisha Daikin Seisakusho. Self adjusting clutch cover assembly. 5,069,322, Cl. 192-70.250.
Mizukoshi, Yasumasa, to Nippon Seiko Kabushiki Kaisha. Tripot type constant velocity universal joint. 5,069,653, Cl. 464-111.000.
Mizuno, Hisayoshi: *See*—
Mori, Masami; Yanagishita, Norio; Matsuura, Ichiro; Ishimaru, Kiichiro; and Mizuno, Hisayoshi, 5,069,838, Cl. 264-46.600.
Mizuno, Yukio; Maruyama, Takashi; and Yachigo, Shinichi, to Sumitomo Chemical Co., Ltd. Resin composition. 5,070,151, Cl. 525-397.000.
Mizutani, Hideo: *See*—
Komatsu, Koichiro; Mizutani, Hideo; Magome, Nobutaka; and Ota, Kazuya, 5,070,250, Cl. 250-548.000.
Mizutani, Hiroshi: *See*—
Ito, Osamu; and Mizutani, Hiroshi, 5,069,676, Cl. 604-358.000.
Mizutani, Minoru, to Oki Electric Industry Co., Ltd. Sheet stacker having sheet-feed function. 5,069,435, Cl. 271-3.000.
MMII Incorporated: *See*—
DeSantis, Dominick A.; and Paul, Robert A., 5,069,816, Cl. 252-315.500.
Moalli, Angelo: *See*—
Masi, Francesco; Moalli, Angelo; Invernizzi, Renzo; Menconi, Francesco; Ferrero, Cesare; Malquori, Stefano; Barazzoni, Lia; and Polesello, Mario, 5,070,051, Cl. 502-9.000.
Mobay Corporation: *See*—
Clarkin, William J., 5,069,881, Cl. 422-135.000.
Mobil Oil Corporation: *See*—
Blain, David A.; and Cardis, Angeline B., 5,069,684, Cl. 44-331.000.
Haag, Werner O.; and Tsikoyiannis, John G., 5,069,794, Cl. 210-650.000.
Min, Taeik; and Touhsaent, Robert E., 5,070,164, Cl. 526-286.000.
Sprunt, Eve S.; and Collins, Samuel H., 5,069,065, Cl. 73-153.000.
Mochida, Haruo; and Watanuki, Yoshio, to Nissan Motor Company, Ltd. Door lock device. 5,069,493, Cl. 292-336.300.
Mochizuki, Seiji; Naka, Takahiro; Hara, Kazuhiko; Takagi, Akira; and Hanaoka, Yukihiro, to Seiko Epson Corporation. Ink near-end detecting device. 5,070,346, Cl. 346-140.00R.
Mockett, Albert P. A.: *See*—
Cook, Jane K. A.; Dolby, Christine A.; Mockett, Albert P. A.; Binns, Matthew M.; Frazier, Judith A.; and Box, Philip, 5,069,902, Cl. 424-89.000.
Modeen, Douglas P.: *See*—
McBrien, Gregory J.; Martin, Anthony N.; and Modeen, Douglas P., 5,069,071, Cl. 73-654.000.
Moden, Walter L.: *See*—
Fogal, Rich; King, Jerrold L.; and Moden, Walter L., 5,070,042, Cl. 437-220.000.

Moder, Thomas R.: *See—*
Warner, Shawn A.; and Moder, Thomas R., 5,070,521, Cl. 379-58.000.
Modes, Christina: *See—*
Blanke, Inge; Burckhardt, Hans-Georg; Gora, Frieder; Guldner, Karlheinz; Dehoust, Jurgen; Modes, Christina; Kemmler-Sack, Sybille; and Schmidt, Joachim, 5,069,824, Cl. 252-518.000.
Modrowski, Thomas A.; Pfister, Larry E.; Raybuck, Gregory A.; and Stoddart, James O., to USX Corporation. Appartaus for improved current transfer in radial cell electroplating. 5,069,762, Cl. 205-137.000.
Modtech Industries, Inc.: *See—*
Prochaska, Sr., John J.; and Wright, Joseph M., 5,069,023, Cl. 56-9.000.
Mogul Corporation, The: *See—*
Roensch, L. Frederick; Chang, Kelvin Y.; and Tanner, Clarence T., 5,069,286, Cl. 166-312.000.
Mohn, Jurgen; and Heine, Wilhelm, to DT Membranfilter Vertiebs GmbH. Spacer element for guiding flowing medium. 5,069,789, Cl. 210-321.840.
Mohrs, Klaus; Perzborn, Elisabeth; Seuter, Friedel; Fruchtmann, Romanis; and Kohlsdorfer, Christian, to Bayer Aktiengesellschaft. Quinolinoxy phenylsulphonamides. 5,070,096, Cl. 514-311.000.
Moli Energy Limited: *See—*
Fong, Rosamaria; Al-Janby, Harith; and Dahn, Jeffrey R., 5,069,683, Cl. 29-623.100.
Molock, Frank: *See—*
Su, Kai C.; and Molock, Frank, 5,070,166, Cl. 526-301.000.
Moltech Invent S.A.: *See—*
Nguyen, Thinh; Lazouni, Adbelkrim; and Doan, Kim S., 5,069,771, Cl. 204-292.000.
Monsanto Company: *See—*
Coran, Aubert Y.; and Davis, Leonard H., 5,070,146, Cl. 525-192.000.
Kavanagh, Dean L.; and Simon, Robert H. M., 5,069,734, Cl. 156-84.000.
Miller, William; and Pulwer, Mitchell J., 5,070,204, Cl. 546-321.000.
Silverman, David C.; Lefelar, Judith A.; and Kinlen, Patrick J., 5,069,974, Cl. 428-422.000.
Welply, Joseph K., 5,070,021, Cl. 435-226.000.
Montalbano, Anthony P.: *See—*
Vanover, Joel L.; Boyer, Jon F.; Hohlbein, Douglas J.; Montalbano, Anthony P.; Montalbano, Christopher P.; and Van Remoortel, John G., 5,070,351, Cl. 354-299.000.
Montalbano, Christopher P.: *See—*
Vanover, Joel L.; Boyer, Jon F.; Hohlbein, Douglas J.; Montalbano, Anthony P.; Montalbano, Christopher P.; and Van Remoortel, John G., 5,070,351, Cl. 354-299.000.
Moore, Charles H.; and Murphy, Robert W., to Harris Corporation. Forth specific language microprocessor. 5,070,451, Cl. 395-375.000.
Moore, Frank D.; and Dolan, Michael J., to Norton Company. Nonwelded support plate or bed limiter for packed towers and method of making same. 5,069,830, Cl. 261-94.000.
Moore, James H., to General Electric Company. Overspeed protection for a gas turbine/steam turbine combined cycle. 5,069,030, Cl. 60-39.270.
Moradpour, Alexandre: *See—*
Penven, Paul; Michel, Philippe; Jerome, Denis; and Moradpour, Alexandre, 5,070,214, Cl. 556-64.000.
Moran, Lyle E., to Exxon Research & Engineering Company. Method for improving the storage stability of polymer modified asphalt. 5,070,123, Cl. 524-69.000.
Mordeki, Drori. Multiple disc type filter and disc construction useful therein. 5,069,790, Cl. 210-323.100.
Moreau, Georges: *See—*
Soulard, Paul; Chassaing, Paul; and Moreau, Georges, 5,070,286, Cl. 318-568.100.
Moreau, Joseph R.; and Dyer, John J., to Norbco, Inc. Tie stall divider. 5,069,163, Cl. 119-27.000.
Morgan Adhesives Co.: *See—*
McClintock, Jack M.; and Knittel, Gerald H., 5,069,969, Cl. 428-36.500.
Mori, Chuzo, to Carl Manufacturing Co., Ltd. Paper-cutting machine and method of cutting paper. 5,069,097, Cl. 83-56.000.
Mori, Koichi: *See—*
Seike, Shoji; Mori, Koichi; Ikeda, Mitsuji; Nozaki, Masayuki; Okajima, Hisakazu; Katsukawa, Hiroyuki; Nakanishi, Kazumi; and Doi, Kenji, 5,069,525, Cl. 385-100.000.
Mori, Koji: *See—*
Ishii, Naoki; Ina, Toshikazu; Mori, Koji; Ito, Katsunori; and Asai, Shigenori, 5,070,293, Cl. 320-2.000.
Mori, Masami; Yanagishita, Norio; Matsuura, Ichiro; Ishimaru, Kiichiro; and Mizuno, Hisayoshi, to Ikeda Bussan Co., Ltd. Method of producing frame-installed seat pad structure. 5,069,838, Cl. 264-46.600.
Mori, Masayuki: *See—*
Iwasa, Masao; and Mori, Masayuki, 5,070,290, Cl. 318-758.000.
Mori, Shigeki: *See—*
Tanaka, Atsushi; Kaneko, Kiyoshi; Yoshimura, Yuichiro; Suzuki, Noriyuki; Kobayashi, Katsuyuki; Mori, Shigeki; and Taniishi, Shinnosuke, 5,070,325, Cl. 340-706.000.
Moriarity, Michael J.: *See—*
Kanjo, Wajih; Krampitz, Mark S.; and Moriarity, Michael J., 5,069,312, Cl. 188-52.000.
Morigami, Takashi, to NEC Corporation. Power-on reset circuit. 5,070,295, Cl. 323-314.000.
Morikane, Hiroyuki, to Mitsubishi Denki K.K. Brush device. 5,070,270, Cl. 310-239.000.
Morimoto, Makoto: *See—*
Kanda, Yutaka; Uosaki, Youichi; Saito, Hiromitsu; Sano, Hiroshi; Kobayashi, Eiji; Morimoto, Makoto; and Nagamura, Satoru, 5,070,092, Cl. 514-253.000.
Morishima, Hideki: *See—*
Haraguchi, Shosuke; Kawamura, Masaharu; and Morishima, Hideki, 5,070,349, Cl. 354-152.000.
Morita, Kunihiko, to Nippon Thompson Co., Ltd. Multi-mode splined ball screw assembly. 5,069,081, Cl. 74-424.00B.
Morita, Toshiki: *See—*
Kako, Mitsumasa; Morita, Toshiki; and Wakita, Motoji, 5,069,564, Cl. 400-605.000.
Moritani, Tohei; Fukutome, Susumu; Motoishi, Yasuo; and Oda, Hidemasa, to Kuraray Co., Ltd. Multilayered packaging materials having high gas barrier property. 5,069,946, Cl. 428-36.600.
Moritoh, Naoya: *See—*
Masaki, Mitsuo; Satoh, Masaru; Moritoh, Naoya; Hashimoto, Koichi; Kamishiro, Toshiro; and Shinozaki, Haruhiko, 5,070,196, Cl. 540-450.000.
Morozov, Vyacheslav G.; and Khavinson, Vladimir K., to Leningradsky Gosudarstvenny Pedagogichesky Institut. Thymus-gland preparation and method for producing same. 5,070,076, Cl. 514-21.000.
Morris, John R.: *See—*
Dodd, Courtney V.; Morris, John R.; and Munie, Gregory C., 5,069,730, Cl. 148-23.000.
Morris, Terry L.: *See—*
Marentic, Francis J.; and Morris, Terry L., 5,069,403, Cl. 244-130.000.
Morrison, Willard L.: *See—*
Mixon, Grover C.; and Morrison, Willard L., 5,069,907, Cl. 424-445.000.
Mortensen, Dennis L.: *See—*
Vetter, William L.; and Mortensen, Dennis L., 5,069,235, Cl. 134-113.000.
Morton International, Inc.: *See—*
Pucci, Mark S.; Shida, Mitsu; Machonis, John, Jr.; and Jachec, Kevin, 5,070,143, Cl. 525-74.000.
Mossberg, Alan I.: *See—*
Velezis, George A.; and Mossberg, Alan I., 5,068,992, Cl. 42-72.000.
Motoishi, Yasuo: *See—*
Moritani, Tohei; Fukutome, Susumu; Motoishi, Yasuo; and Oda, Hidemasa, 5,069,946, Cl. 428-36.600.
Motorola, Inc.: *See—*
Cambou, Bertrand, 5,070,382, Cl. 357-48.000.
Cho, Frederick Y.; and Fliegel, Frederick M., 5,070,271, Cl. 310-313.00R.
Dworkin, David R.; Lloyd, Robert D.; and Nguyen, Tuan, 5,069,986, Cl. 429-27.000.
Hietala, Alexander W.; and Rabe, Duane C., 5,070,310, Cl. 331-1.00A.
Jasinaki, Leon, 5,070,329, Cl. 340-825.440.
Maber, John W.; and Ranz, Stephen J., 5,070,499, Cl. 370-61.000.
Pfiester, James R.; and Hayden, James D., 5,070,029, Cl. 437-29.000.
Warner, Shawn A.; and Moder, Thomas R., 5,070,521, Cl. 379-58.000.
Zdebel, Peter J., 5,070,031, Cl. 437-33.000.
Moulding, Frank E., to Ford Motor Company. Roller cylinder assembly for press forming glass sheets and method of using. 5,069,046, Cl. 65-106.000.
Mount Sinai School of Medicine of the City University of New York: *See—*
Kaminski, Ram, 5,070,101, Cl. 514-399.000.
Mouri, Isamu: *See—*
Kobayashi, Yoshiyuki; Suehaga, Takashi; Mouri, Isamu; and Fujii, Tukasa, 5,069,724, Cl. 134-37.000.
Moyher, George C., Jr.; Jamerson, Randy; Nessim, David; Kapec, Jeffrey; Tanaka, Kazuna; and Chochinov, Allan, to Electrolux Water Systems, Inc. Fluid purification systems. 5,069,782, Cl. 210-192.000.
MTS Systems Corporation: *See—*
Nyce, David S., 5,070,485, Cl. 367-127.000.
MTU Motoren-und Turbine-Union: *See—*
Deutschmann, Herbert; and Sudmanns, Hans, 5,069,194, Cl. 123-612.000.
Muan, Arnulf; and Najjar, Mitri S., to Texaco Inc. Compositions involving V_2O_3-Al_2O_3-CaO. 5,070,065, Cl. 502-341.000.
Mueller, Dietrich-Wolfgang: *See—*
Dersch, Rolf; Dehne, Heinrich; Gellert, Roland; Mueller, Dietrich-Wolfgang; Vinke, Johannes; and Wistuba, Eckehardt, 5,070,136, Cl. 524-555.000.
Mueller, Hermann; Hendron, Timothy J.; and Dawood, David, to Lawter International, Inc. Bulk bag handling and discharging apparatus. 5,069,596, Cl. 414-607.000.
Mueller, Karl F.: *See—*
Robertson, J. Richard; Su, Kai C.; Goldenberg, Merrill S.; and Mueller, Karl F., 5,070,169, Cl. 528-25.000.
Mugglestone, Peter R.; and Ng, Alison, to Thomson Industries, Inc. Linear bearing assembly. 5,069,555, Cl. 384-43.000.
Mukasa, Takashi: *See—*
Ohneda, Noboru; Ushioda, Shunta; Arima, Haruo; Hashimoto, Ichiro; Kaneko, Denziro; Sugiyama, Kazuo; Fukazawa, Tsuguo; Tachi, Teruo; and Mukasa, Takashi, 5,069,095, Cl. 82-124.000.

Muller, Fritz: *See*—
Grote, Dieter; Muller, Fritz; and Pavlicek, Heinz, 5,069,839, Cl. 264-63.000.

Muller, Hans; and Trapp, Joachim, to Renk Aktiengesellschaft. Bearing with selectable electrical conductivity. 5,069,559, Cl. 384-277.000.

Muller, Heinz: *See*—
Auberger, Heinrich; and Muller, Heinz, 5,069,429, Cl. 266-143.000.

Muller-Lierheim, Wolfgang: *See*—
Hofer, Peter; Muller, Ulrich; Barenz, Manfred; Schafer, Horst; and Muller-Lierheim, Wolfgang, 5,069,542, Cl. 351-160.00H.

Muller, Louis: *See*—
Watts, Arun; Muller, Louis; Verhelst, Gabriel; De Witte, Mireille; Pham, Tu; and Parfondry, Alain, 5,070,114, Cl. 521-159.000.

Muller, Michael; Podszun, Wolfgang; and Winkel, Jens, to Bayer Aktiengesellschaft. Urea-containing (meth)acrylic acid derivatives of triisocyanates-compositions for an artificial tooth. 5,070,165, Cl. 526-301.000.

Muller, Ulrich: *See*—
Hofer, Peter; Muller, Ulrich; Barenz, Manfred; Schafer, Horst; and Muller-Lierheim, Wolfgang, 5,069,542, Cl. 351-160.00H.

Muller, Wolfgang, to J. M. Voith GmbH. Pocket sealing strip arrangement in a single-wire drying group. 5,068,980, Cl. 34-117.000.

Mullin, Eugene T.: *See*—
Lazzarotti, S. James; Wojtowicz, Edward A.; Mullin, Eugene T.; and Nadel, Jess, 5,069,440, Cl. 271-202.000.

Multiform Desiccants, Inc.: *See*—
Cullen, John S.; and Incorvia, Samuel A., 5,069,694, Cl. 55-318.000.

Munie, Gregory C.: *See*—
Dodd, Courtney V.; Morris, John R.; and Munie, Gregory C., 5,069,730, Cl. 148-23.000.

Munson, Harry R., Jr.: *See*—
Jagdmann, Gunnar E., Jr.; and Munson, Harry R., Jr., 5,070,095, Cl. 514-305.000.

Munster, Erhard: *See*—
Buckley, Dieter; Munster, Erhard; and Schwarz, Wolfgang, 5,069,130, Cl. 102-202.000.

Muonning, Andreas: *See*—
Fischer, Joachim; and Muonning, Andreas, 5,069,725, Cl. 134-42.000.

Murahashi, Takashi; Sugano, Masashi; Maruyama, Hiroyuki; and Yokobori, Jun, to Konica Corporation. Color image forming apparatus. 5,070,374, Cl. 355-326.000.

Murahashi, Takashi: *See*—
Sugano, Masahi; Murahashi, Takashi; Maruyama, Hiroyuki; and Yokobori, Jun, 5,070,367, Cl. 355-326.000.

Murakami, Takuya: *See*—
Kakimoto, Toshihiko; and Murakami, Takuya, 5,069,431, Cl. 267-141.000.

Murakami, Yoji: *See*—
Yamagishi, Takashi; Yamamoto, Yukito; and Murakami, Yoji, 5,069,944, Cl. 427-444.000.

Murakoshi, Motoharu: *See*—
Waketa, Hideharu; Suzuki, Yoshiharu; Murakoshi, Motoharu; Kakiuchi, Hideaki; Ohgushi, Masuhito; Watanabe, Kenichi; and Sawai, Toshiya, 5,069,971, Cl. 428-391.000.

Murano, Katsuaki; Yamashita, Yoshinori; Hirano, Sadayuki; Tatsumi, Takumi; and Yamamoto, Hiroaki, to Suzuki Jidosha Kogyo Kabushiki Kaisha; and Mitsubishi Denki Kabushiki Kaisha. Belt ratio controller for a continuously vaiable transmission. 5,069,086, Cl. 74-866.000.

Muraoka, Toshinori: *See*—
Fukano, Masahiko; and Muraoka, Toshinori, 5,070,373, Cl. 355-290.000.

Murata, Kenji: *See*—
Kouzuma, Shinichi; Inoue, Hiroshi; Murata, Kenji; Tanaka, Hiroyuki; and Kishi, Yasuo, 5,069,727, Cl. 136-251.000.

Murata Manufacturing Co., Ltd.: *See*—
Sakamoto, Yukio; Hori, Toshio; and Fukutani, Iwao, 5,069,641, Cl. 439-620.000.

Murata, Masahiro; Tanaka, Yukiyasu; and Kokawa, Tomoo, to Kansai Paint Co., Ltd. Multilayer coating for the interior surface of a can. 5,069,956, Cl. 428-216.000.

Murata, Perry L.: *See*—
Harbolt, Bruce A.; and Murata, Perry L., 5,069,352, Cl. 220-1.500.

Murata, Sadao; Harada, Yasuhiro; and Hama, Susumu, to Seiko Epson Corporation. Print wheel printer having separable trigger casing and main housing. 5,069,123, Cl. 101-93.210.

Murata, Yoshifumi: *See*—
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 5,070,172, Cl. 528-76.000.

Murata, Yuzo: *See*—
Nakamura, Kyuzo; Ota, Yoshifumi; Ishikawa, Michio; Tani, Noriaki; Hashimoto, Masanori; and Murata, Yuzo, 5,069,983, Cl. 428-694.000.

Murdock, Keith C.; and Lee, Ving J., to American Cyanamid Company. Solubilized pro-drugs. 5,070,082, Cl. 514-105.000.

Murga, Jose . Roller skate including at least two rollers aligned along a median plane. 5,069,462, Cl. 280-23.000.

Murphy, Andrew P., to United States of America, Interior. Chemical process for the denitrification of water. 5,069,800, Cl. 210-757.000.

Murphy, James P. Picture hanger. 5,069,411, Cl. 248-476.000.

Murphy, Patrick E. Flexible raised pavement marker. 5,069,577, Cl. 404-11.000.

Murphy, Patrick M. Cleaning zebramussels from water pipes. 5,069,722, Cl. 134-22.110.

Murphy, Robert W.: *See*—
Moore, Charles H.; and Murphy, Robert W., 5,070,451, Cl. 395-375.000.

Murray, David E.: *See*—
Shirey, Ray A.; and Murray, David E., 5,069,172, Cl. 122-382.000.

Murray, Terry A.: *See*—
Canterberry, J. B.; and Murray, Terry A., 5,069,133, Cl. 102-332.000.

Musolf, Douglas J.: *See*—
Dupon, Ryan W.; Thompson, Mark S.; Wiseman, Gary H.; Musolf, Douglas J.; and Tanous, Adam C., 5,070,050, Cl. 501-108.000.

Mussett, Gerard: *See*—
Kennedy, David; Mussett, Gerard; Van Maanan, Alfons; and Smetham, James N., 5,069,131, Cl. 102-275.600.

Muszynski, Larry C., to Power Lone Star, Inc. Pipeline casing insulator. 5,069,255, Cl. 138-149.000.

Mutoh, Kiyoyuki: *See*—
Tsumura, Hiroshi; Mutoh, Kiyoyuki; Satoh, Kazushi; and Isobe, Ken-ichi, 5,070,175, Cl. 528-12.000.

Nadel, Jess: *See*—
Lazzarotti, S. James; Wojtowicz, Edward A.; Mullin, Eugene T.; and Nadel, Jess, 5,069,440, Cl. 271-202.000.

Nagahiro, Kenichi: *See*—
Inoue, Kazuo; Sano, Shoichi; Ogura, Misami; Nagahiro, Kenichi; Konno, Tsuneo; Kajiwara, Hajime; Ono, Yoshinobu; Yoshida, Suguru; Shimada, Hiroo; and Hashiguchi, Masahiro, 5,069,306, Cl. 180-291.000.

Nagai, Yoshiaki: *See*—
Kitazawa, Hideki; Terada, Ryohei; Takeuchi, Shogo; Kayama, Tsutomu; Tanimoto, Kohichi; Utsugi, Nobuo; and Nagai, Yoshiaki, 5,070,431, Cl. 362-31.000.

Nagamura, Satoru: *See*—
Kanda, Yutaka; Uosaki, Youichi; Saito, Hiromitsu; Sano, Hiroshi; Kobayashi, Eiji; Morimoto, Makoto; and Nagamura, Satoru, 5,070,092, Cl. 514-253.000.

Nagano, Hirosaku: *See*—
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Nagano, Masami; Atago, Takeshi; and Nemoto, Mamoru, to Hitachi, Ltd.; and Hitachi Automotive Eng Co., Ltd. Multi-cylinder engine control method and electronic control apparatus therefor. 5,069,183, Cl. 123-419.000.

Nagao, Shigemitsu: *See*—
Sasaoka, Michio; Saito, Nori; Shiroi, Takashi; Nagao, Shigemitsu; Kikuchi, Ryo; and Kameyama, Yutaka, 5,070,194, Cl. 540-214.000.

Nagaoka Kanaami Kabushiki Kaisha: *See*—
Nagaoka, Tadayoshi, 5,069,279, Cl. 166-234.000.

Nagaoka, Tadayoshi, to Nagaoka Kanaami Kabushiki Kaisha. Well structure having a screen element with wire supporting rods. 5,069,279, Cl. 166-234.000.

Nagasaki, Tatsuo: *See*—
Komiya, Yasuhiro; and Nagasaki, Tatsuo, 5,070,353, Cl. 354-402.000.

Nagashima, Toshiharu: *See*—
Arai, Takeo; Kato, Mariko; and Nagashima, Toshiharu, 5,070,005, Cl. 430-523.000.

Nagata, Osamu; and Seo, Keiji, to Brother Kogyo Kabushiki Kaisha. Pressure developing apparatus. 5,070,359, Cl. 355-27.000.

Najjar, Mitri S.: *See*—
Muan, Arnulf; and Najjar, Mitri S., 5,070,065, Cl. 502-341.000.

Naka, Takahiro: *See*—
Mochizuki, Seiji; Naka, Takahiro; Hara, Kazuhiko; Takagi, Akira; and Hanaoka, Yukihiro, 5,070,346, Cl. 346-140.00R.

Nakada, Hitoshi; Wakimoto, Takeo; Shinkai, Masanao; and Matsunaga, Daisaku, to Pioneer Electronic Corporation; and Nippon Kayaku Kabushiki Kaisha. Electroluminescent element. 5,069,975, Cl. 428-457.000.

Nakada, Junji; Takeuchi, Hideaki; and Yasunaga, Tadashi, to Fuji Photo Film Co., Ltd. Method of winding up a magnetic recording medium. 5,069,932, Cl. 427-129.000.

Nakada, Ryo: *See*—
Fukumoto, Katsuhisa; Kawanishi, Kiyotaka; Nakada, Ryo; and Yamano, Junpei, 5,069,960, Cl. 428-310.500.

Nakae, Yasuhiko: *See*—
Nakano, Shinji; Ohsugi, Hiroharu; Nakae, Yasuhiko; Tanabe, Hisaki; Takagawa, Ryozo; Eguchi, Yoshio; Tsutsui, Koichi; and Endo, Takeshi, 5,070,161, Cl. 526-193.000.

Nakagawa, Katsuya, to Nintendo Company Limited. External memory having an authenticating processor and method of operating same. 5,070,479, Cl. 395-575.000.

Nakagawa, Noriko; Yasumoto, Takaaki; and Nakai, Toshio. Aluminum nitride substrate for formation of thin-film conductor layer and semiconductor device using the substrate. 5,070,393, Cl. 357-80.000.

Nakai, Kiyonari, to Tokai Carbon Co., Ltd. Carbon black for tire tread. 5,069,892, Cl. 423-445.000.

Nakai, Toshio: *See*—
Nakagawa, Noriko; Yasumoto, Takaaki; and Nakai, Toshio, 5,070,393, Cl. 357-80.000.

Nakajima, Shigeo: *See*—
Fujimiya, Hitoshi; Nakajima, Shigeo; and Nasu, Hisanori, 5,069,769, Cl. 204-182.800.

Nakajima, Shoji: *See*—
Okazaki, Iwao; Abe, Koichi; and Nakajima, Shoji, 5,069,962, Cl. 428-323.000.

Nakajima, Takashi; Yugi, Akira; and Iwase, Shinichi, to Mitsubishi Denki Kabushiki Kaisha. Plated copper alloy material. 5,069,979, Cl. 428-644.000.

Nakajima, Takashi: *See*—
Toyonishi, Shigekazu; and Nakajima, Takashi, 5,070,126, Cl. 524-224.000.

Nakajima, Tatsuo: *See*—
Honda, Naoko; and Nakajima, Tatsuo, 5,070,298, Cl. 324-207.200.

Nakajima, Yoshiki: *See*—
Ogawa, Masaharu; Nakajima, Yoshiki; Ito, Osamu; Furukawa, Teruo; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Ototake, Masafumi; and Ozaki, Minoru, 5,070,492, Cl. 369-47.000.

Nakamura, Hiroaki: *See*—
Iwata, Hiroo; Miyaki, Yoshiyuki; and Nakamura, Hiroaki, 5,069,926, Cl. 427-40.000.

Nakamura, Kosei; and Numai, Kazuhisa, to Fanuc Ltd. Connection switching apparatus for three-phase induction motor. 5,070,291, Cl. 318-771.000.

Nakamura, Kyuzo; Ota, Yoshifumi; Ishikawa, Michio; Tani, Noriaki; Hashimoto, Masanori; and Murata, Yuzo, to Nihon Shinku Gijutsu Kabushiki Kaisha. Magnetic recording member. 5,069,983, Cl. 428-694.000.

Nakamura, Miki; and Ohkura, Eiji, to Diesel KiKi Co., Ltd. Vehicle-loaded heat exchanger of parallel flow type. 5,069,277, Cl. 165-173.000.

Nakamura, Shigeru: *See*—
Fujita, Yoshihiro; and Nakamura, Shigeru, 5,070,004, Cl. 430-393.000.

Nakamura, Tatsushi: *See*—
Kakino, Shigeru; Nakamura, Tatsushi; Tamari, Toshinori; and Takahashi, Masao, 5,069,132, Cl. 102-331.000.

Nakamura, Yoshio; Shinohara, Junichi; and Kishida, Daisuke, to Ricoh Company, Ltd. Camera having television mode. 5,070,356, Cl. 354-439.000.

Nakamura, Yoshio: *See*—
Satoh, Tamotsu; Yonehara, Takao; and Nakamura, Yoshio, 5,070,034, Cl. 437-52.000.

Nakamura, Yoshiyuki: *See*—
Kato, Tetsuro; and Nakamura, Yoshiyuki, 5,070,465, Cl. 395-141.000.

Nakamura, Yukio: *See*—
Okumura, Toshikata; Nakamura, Yukio; Yoneoka, Noriei; and Hachikawa, yuiti, 5,069,832, Cl. 264-23.000.
Yokoi, Hidetoshi; Okumura, Toshikato; Nakamura, Yukio; Yoneoka, Noriei; and Hachikawa, Syuiti, 5,069,833, Cl. 264-23.000.

Nakanishi, Chitose: *See*—
Konushi, Fumihiro; Nakatu, Hiroshi; Inoguchi, Kazuhiko; Okumura, Toshiyuki; Seki, Akinori; Takiguchi, Haruhisa; Nakanishi, Chitose; Sugahara, Satoshi; and Kudo, Hiroaki, 5,070,510, Cl. 372-46.000.

Nakanishi, Hiroshi: *See*—
Namba, Keizo; Itoh, Yasunaga; and Nakanishi, Hiroshi, 5,069,980, Cl. 428-654.000.

Nakanishi, Kazumi: *See*—
Seike, Shoji; Mori, Koichi; Ikeda, Mitsuji; Nozaki, Masayuki; Okajima, Hisakazu; Katsukawa, Hiroyuki; Nakanishi, Kazumi; and Doi, Kenji, 5,069,525, Cl. 385-100.000.

Nakano, Shinji; Ohsugi, Hiroharu; Nakae, Yasuhiko; Tanabe, Hisaki; Takagawa, Ryozo; Eguchi, Yoshio; Tsutsui, Koichi; and Endo, Takeshi, to Nippon Paint Co., Ltd. Heat-latent, cationic polymerization initiator and resin compositions containing same. 5,070,161, Cl. 526-193.000.

Nakasaki, Eiji; Shirashoji, Hisashi; Hoshikawa, Katsuyuki; Kamijo, Takao; Ikeda, Kazushige; Inoue, Yasuhiro; and Kato, Takeo, to Rubber Industries, Ltd. Motorcycle tire with non-zero degree band radially outward of the breaker. 5,069,262, Cl. 152-536.000.

Nakatani, Shigeki; and Idemoto, Takahiro, to Mazda Motor Corporation. Cylinder block making method and device. 5,069,266, Cl. 164-112.000.

Nakatani, Umewaka: *See*—
Hara, Shigeyoshi; and Nakatani, Umewaka, 5,069,943, Cl. 427-400.000.

Nakatu, Hiroshi: *See*—
Konushi, Fumihiro; Nakatu, Hiroshi; Inoguchi, Kazuhiko; Okumura, Toshiyuki; Seki, Akinori; Takiguchi, Haruhisa; Nakanishi, Chitose; Sugahara, Satoshi; and Kudo, Hiroaki, 5,070,510, Cl. 372-46.000.

Nakayama, Kazuo: *See*—
Takasu, Hiroshi; Arase, Susumu; Yokota, Junichiro; and Nakayama, Kazuo, 5,069,855, Cl. 264-235.000.

Nakayama, Masatoshi: *See*—
Yokoyama, Kenji; Nakayama, Masatoshi; Shimozawa, Toru; Ueda, Kunihiro; and Maruta, Fumio, 5,069,967, Cl. 428-336.000.

Nakazawa, Ribun, to Teikoku Piston Ring Co., Ltd. Printing head for resistive ribbon type printing apparatus. 5,070,343, Cl. 346-76.0PH.

Nalco Chemical Company: *See*—
Trivett, Robert L., 5,069,806, Cl. 252-52.00A.

Namba, Keizo; Itoh, Yasunaga; and Nakanishi, Hiroshi, to Sumitmo Light Metal Industries, Ltd. Vacuum-brazing aluminum cladding material consisting of Al or Al alloy core and two superposed aluminum alloy clads which cover at least one surface of the core. 5,069,980, Cl. 428-654.000.

Nanba, Katsuyuki: *See*—
Inoue, Manabu; Taniguchi, Nobuyuki; Nanba, Katsuyuki; Kudo, Yoshinobu; Iwata, Michihiro; and Wada, Shigeru, 5,070,355, Cl. 354-413.000.

Naparst, Harold L.: *See*—
Singer, Jerome R.; Grunbaum, Francisco A.; Kohn, Philip D.; Zubelli, Jorge P.; Couch, John L.; Naparst, Harold L.; and Latham, Geoffrey, 5,070,455, Cl. 364-413.190.

Narisawa, Shizuo: *See*—
Oyamada, Takeo; Taira, Yoshito; Nitta, Masayoshi; Kaneshima, Yasuo; Kurino, Tateshi; and Narisawa, Shizuo, 5,070,134, Cl. 524-503.000.

Narula, Anubhav P. S.; De Virgilio, John J.; Benaim, Carlos; Ouwerkerk, Anton V.; and Gillotin, Olivier, to International Flavors & Fragrances Inc. Substituted cyclopentenyl-oxabicyclooctanes, cyclopentenyl-formylcyclohexenes and cyclopentenyl-hydroxymethyl cyclohexenes, processes for preparing same and organoleptic uses thereof. 5,070,073, Cl. 512-13.000.

Naruse, Hideaki; and Yoshida, Kazuaki, to Fuji Photo Film Co., Ltd. Method for processing silver halide color photographic material. 5,070,003, Cl. 430-389.000.

Nassovia Werkzeugmaschinen GmbH: *See*—
Topfer, Klaus; and Popp, Konrad J., 5,070,224, Cl. 219-69.120.

Nasu, Hisanori: *See*—
Fujimiya, Hitoshi; Nakajima, Shigeo; and Nasu, Hisanori, 5,069,769, Cl. 204-182.800.

National Research Council of Canada: *See*—
Majid, Abdul; and Ripmeester, John A., 5,070,081, Cl. 514-58.000.

National Research Development Corporation: *See*—
Street, Michael J.; Benson, John A.; Marchant, John A.; Wilkin, Arthur L.; and Allen, Clive J., 5,069,160, Cl. 119-14.080.

Naujoks, Kurt W.: *See*—
Klein, Christian; Batz, Hans-Georg; Essig, Ulrich; and Naujoks, Kurt W., 5,070,025, Cl. 436-546.000.

Nauta, Gadze C.: *See*—
Schuerman, Cornelis P.; and Nauta, Gadze C., 5,070,531, Cl. 382-49.000.

Navistar International Transportation Corp.: *See*—
Shust, Deborah J.; Selzer, Robert J.; and Adamisin, Dennis A., 5,069,538, Cl. 359-871.000.

NEC Corporation: *See*—
Hirai, Yoshihiko, 5,069,534, Cl. 359-54.000.
Kobayashi, Tadashi; and Kudo, Tetuo, 5,070,217, Cl. 178-19.000.
Morigami, Takashi, 5,070,295, Cl. 323-314.000.
Nochi, Hideo, 5,070,294, Cl. 323-267.000.
Okamoto, Toshiyuki, 5,070,306, Cl. 330-253.000.
Shimizu, Hiroshi, 5,070,501, Cl. 370-85.400.
Yamagata, Yasushi, 5,070,378, Cl. 357-23.500.

Neeley, Charles M.: *See*—
Vanderbilt, Jeffrey J.; and Neeley, Charles M., 5,070,122, Cl. 524-47.000.

Neil Pryde Limited: *See*—
Pascher, Reinhard, 5,069,153, Cl. 114-39.200.

Nelson, Edward T.: *See*—
Erhardt, Herbert J.; Nelson, Edward T.; and Stevens, Eric G., 5,070,380, Cl. 357-24.000.

Nelson, Paige R.: *See*—
Schmidt, Thomas A.; Overland, David A.; Huffman, Paul F.; and Nelson, Paige R., 5,069,180, Cl. 123-376.000.

Nemoto, Mamoru: *See*—
Nagano, Masami; Atago, Takeshi; and Nemoto, Mamoru, 5,069,183, Cl. 123-419.000.

Nergaard, Arnfinn: *See*—
Freyer, Jan; and Nergaard, Arnfinn, 5,069,488, Cl. 285-302.000.

Nessim, David: *See*—
Moyher, George C., Jr.; Jamerson, Randy; Nessim, David; Kapec, Jeffrey; Tanaka, Kazuna; and Chochinov, Allan, 5,069,782, Cl. 210-192.000.

Nestec S.A.: *See*—
Lee, Eldon C.; and Gum, Ernest K., 5,069,925, Cl. 426-597.000.

Nestler, Gunter: *See*—
Kochler, Helmut; and Nestler, Gunter, 5,070,517, Cl. 375-117.000.

Neton, Janet: *See*—
Hwa, Chih M.; Kelly, John A.; Neton, Janet; Scanlon, Patricia M.; and Gaudette, Roger R., 5,069,798, Cl. 210-700.000.

Netter, Paul L.: *See*—
Comte, Marie J. M.; Netter, Paul L.; and Ricoult, Daniel L. G., 5,070,045, Cl. 501-4.000.

Neumann, Erwin: *See*—
Amthor, Thomas; Neumann, Erwin; von Rolbicki, Wolfgang; and Starke Frank, 5,069,505, Cl. 297-216.000.

Neumann, Peter: *See*—
Leyrer, Reinhold J.; Neumann, Peter; and Dust, Matthias, 5,069,991, Cl. 430-49.000.

Newman, Anthony E. Locking coin display holder. 5,069,347, Cl. 211-4.000.

Newman, George E.: *See*—
Hogregfe, Robert; Knox, David J.; and Newman, George E., 5,069,003, Cl. 51-283.00R.

Ng, Alison: *See*—
Mugglestone, Peter R.; and Ng, Alison, 5,069,555, Cl. 384-43.000.

Ng, Raymond C. Fluid aspiration needle. 5,069,665, Cl. 604-51.000.

NGK Insulators, Ltd.: *See*—
Hamaguchi, Kunikazu; Harada, Takashi; and Hamanaka, Toshiyuki, 5,069,697, Cl. 55-523.000.

Seike, Shoji; Mori, Koichi; Ikeda, Mitsuji; Nozaki, Masayuki; Okajima, Hisakazu; Katsukawa, Hiroyuki; Nakanishi, Kazumi; and Doi, Kenji, 5,069,525, Cl. 385-100.000.

NGS American, Inc.: *See*—
Doyle, Findley C., Jr.; and Alcott, William D., III, 5,070,452, Cl. 364-401.000.

Nguyen, Julien T.: *See*—
Faul, Jerome F.; and Nguyen, Julien T., 5,070,532, Cl. 382-56.000.

Nguyen, Thinh; Lazouni, Adbelkrim; and Doan, Kim S., to Moltech Invent S.A. Molten salt electrolysis with non-consumable anode. 5,069,771, Cl. 204-292.000.

Nguyen, Tuan: *See*—
Dworkin, David R.; Lloyd, Robert D.; and Nguyen, Tuan, 5,069,986, Cl. 429-27.000.

Nicolai, Jean, to SGS-Thomson Microelectronics SA. Integrated circuit with adjustable oscillator with frequency independent of the supply voltage. 5,070,311, Cl. 331-111.000.

Nicolas, Jean-Claude; and Saulnier, Raymond, to Cime Bocuze. Process for direct shaping and optimization of the mechanical characteristics of penetrating projectiles of high-density tungsten alloy. 5,069,869, Cl. 419-28.000.

Nicollini, Germano: *See*—
Confalonieri, Pierangelo; and Nicollini, Germano, 5,070,305, Cl. 330-69.000.

Nicols, Carl W.; Lorang, Michael J.; Wold, Michael O.; and Rayfield, Jerry W., to Cyprus Mines Corporation. Method and apparatus for friction sorting of particulate materials. 5,069,346, Cl. 209-700.000.

Nieberding, Jean-Louis. Method and kiln for firing ceramic articles. 5,069,618, Cl. 432-137.000.

Niedermeier, Rudolf; and Schottdorf, Johannes, to FAG Kugelfischer Georg Schafer. Cage for sealing a bearing. 5,069,560, Cl. 384-486.000.

Nielsen, Anders G., to Van Voskuilen-Woudenberg B.V. Apparatus for treating an exterior pipe surface. 5,069,234, Cl. 134-113.000.

Nietering, Kenneth E., to Ford Motor Company. Laminated glazing unit having improved interfacial adhesion. 5,069,968, Cl. 428-336.000.

Nigrin, Jaroslava M.: *See*—
Amundson, W. Duane, Jr.; and Nigrin, Jaroslava M., 5,070,043, Cl. 501-3.000.

Nihon Plast Co., Ltd.: *See*—
Takayama, Yukio; and Yuge, Yuko, 5,069,112, Cl. 98-69.000.

Nihon Shinku Gijutsu Kabushiki Kaisha: *See*—
Nakamura, Kyuzo; Ota, Yoshifumi; Ishikawa, Michio; Tani, Noriaki; Hashimoto, Masanori; and Murata, Yuzo, 5,069,983, Cl. 428-694.000.

Niikawa, Ryo: *See*—
Watanabe, Shinpei; Watanabe, Yasuto; Ikeda, Yuzi; Gunji, Keiichiro; and Niikawa, Ryo, 5,069,524, Cl. 385-59.000.

Niinomi, Toshihiko; Funakoshi, Ryohei; Kaseda, Shigeru; and Takahashi, Koichi, to Mitsubishi Jukogyo Kabushiki Kaisha; and Idemitsu Kosan Company Limited. Plant fault diagnosis system. 5,070,468, Cl. 364-550.000.

Niitsu, Ichiro: *See*—
Okuyama, Nobutaka; Sakurai, Soichi; Kitou, Kouji; Ohsawa, Michitaka; Niitsu, Ichiro; Yoshioka, Hiroshi; Takeyama, Atushi; Obara, Masao; and Yoshimi, Isao, 5,070,280, Cl. 315-368.110.

Nikkin Flux Inc.: *See*—
Ohyama, Koji; and Tsunoda, Masaki, 5,069,875, Cl. 420-548.000.

Nikolic, Vida: *See*—
Kovacic, Mateja; Milovac, Jenny; Cvelbar, Polona; Stalc, Anton; Trost, Zvezdana; Kopitar, Zdravko; Kofler, Bojan; Nikolic, Vida; Lampret, Marija; and Lippai, Marija, 5,069,910, Cl. 424-464.000.

Nikon Corporation: *See*—
Ejima, Satoshi; and Suzuki, Masahiro, 5,070,405, Cl. 358-209.000.
Kazami, Kazuyuki; Daitoku, Koichi; Ezawa, Akira; Ohtsuka, Kazuto; and Inoue, Hideya, 5,070,357, Cl. 354-468.000.
Komatsu, Koichiro; Mizutani, Hideo; Magome, Nobutaka; and Ota, Kazuya, 5,070,250, Cl. 250-548.000.

Niksic, Mark R., to T. A. Pelsue Company. Nub assembly for tent frame struts. 5,069,572, Cl. 403-170.000.

Nill, Eberhard; and Tischer, Kurt M., to Nokia Unterhaltungselektronik. Method of manufacturing the luminescent screen of a display device. 5,069,733, Cl. 156-67.000.

Nilsen, Jan: *See*—
Hovland, Heljar; Nilsen, Jan; and Strom, Yngve, 5,069,005, Cl. 51-322.000.

Nilsen, Martin J.: *See*—
Ernst, Richard J.; Van Allman, Don T.; Gupta, Harish C.; Dill, Michael C.; and Nilsen, Martin J., 5,069,340, Cl. 206-347.000.

Nilssen, Ole K. Combined signal and power distribution system. 5,070,522, Cl. 379-90.000.

Ninamibata, Yukimitsu: *See*—
Emori, Yasuyoshi; and Ninamibata, Yukimitsu, 5,069,250, Cl. 137-625.230.

Nintendo Company Limited: *See*—
Nakagawa, Katsuya, 5,070,479, Cl. 395-575.000.

Nippon Chemical Plant Consultant Co., Ltd.: *See*—
Maruko, Saburo, 5,069,169, Cl. 122-33.000.

Nippon Chemiphar Co., Ltd.: *See*—
Masaki, Mitsuo; Yamakawa, Tomio; Satoh, Masaru; Takeda, Hiromitsu; Yoshino, Yasushi; and Matsukura, Hitoshi, 5,070,089, Cl. 514-255.000.
Masaki, Mitsuo; Satoh, Masaru; Moritoh, Naoya; Hashimoto, Koichi; Kamishiro, Toshiro; and Shinozaki, Haruhiko, 5,070,196, Cl. 540-450.000.

Nippon Hoso Kyokai: *See*—
Kikawa, Takeshi; Tsuji, Kazutaka; Sameshima, Kenji; Hirai, Tadaaki; Yamazaki, Junichi; Kubota, Misao; and Shidara, Keiichi, 5,070,272, Cl. 313-386.000.
Nishida, Yasuaki; Fujita, Yoshihiro; Iino, Yoshiki; and Kawada, Norihiko, 5,069,530, Cl. 359-498.000.

Nippon Kayaku Kabushiki Kaisha: *See*—
Nakada, Hitoshi; Wakimoto, Takeo; Shinkai, Masanao; and Matsunaga, Daisaku, 5,069,975, Cl. 428-457.000.

Nippon Mining Co., Ltd.: *See*—
Hattori, Kazuo; and Taniguchi, Mitsuhiro, 5,070,035, Cl. 437-184.000.

Nippon Oil and Fats Company, Limited: *See*—
Kakino, Shigeru; Nakamura, Tatsushi; Tamari, Toshinori; and Takahashi, Masao, 5,069,132, Cl. 102-331.000.

Nippon Paint Co., Ltd.: *See*—
Arai, Tetsuzo; Yamamoto, Yasushi; Raijo, Mitsuyuki; and Fujita, Isao, 5,069,929, Cl. 427-54.100.
Nakano, Shinji; Ohsugi, Hiroharu; Nakae, Yasuhiko; Tanabe, Hisaki; Takagawa, Ryozo; Eguchi, Yoshio; Tsutsui, Koichi; and Endo, Takeshi, 5,070,161, Cl. 526-193.000.
Sakamoto, Hiroyuki; Tobinaga, Kenshiro; and Tsuchiya, Yasuyuki, 5,070,120, Cl. 523-412.000.
Tsuboniwa, Noriyuki; Urano, Satoshi; and Mizuguchi, Ryuzo, 5,070,167, Cl. 526-301.000.

Nippon Seiko Kabushiki Kaisha: *See*—
Mizukoshi, Yasumasa, 5,069,653, Cl. 464-111.000.

Nippon Soken, Inc.: *See*—
Ishii, Naoki; Ina, Toshikazu; Mori, Koji; Ito, Katsunori; and Asai, Shigenori, 5,070,293, Cl. 320-2.000.

Nippon Thompson Co., Ltd.: *See*—
Morita, Kunihiko, 5,069,081, Cl. 74-424.00B.
Tanaka, Kazuhiko, 5,069,088, Cl. 74-89.150.

Nippondenso Co., Ltd.: *See*—
Ishii, Naoki; Ina, Toshikazu; Mori, Koji; Ito, Katsunori; and Asai, Shigenori, 5,070,293, Cl. 320-2.000.
Tsutsumi, Yasuhiro; Yokoya, Yuji; Hara, Yoshimichi; Matsunaga, Eiju; Kawata, Hiroyuki; Fukami, Akira; and Suzuki, Yutaka, 5,069,476, Cl. 280-707.000.

Nishi, Masahiro, to Kyoritsu Electric Corporation. Method for making dry sheet-like sample of solid particles from a suspension. 5,069,753, Cl. 162-49.000.

Nishida, Yasuaki; Fujita, Yoshihiro; Iino, Yoshiki; and Kawada, Norihiko, to Nippon Hoso Kyokai; and Ikegami Tsushinki Co., Ltd. Solid state image pick-up apparatus. 5,069,530, Cl. 359-498.000.

Nishikawa, Masaji, to Olympus Optical Co., Ltd. Method of manufacturing ion flow recording head. 5,068,961, Cl. 29-825.000.

Nishikawa, Takafumi: *See*—
Kato, Akira; Nishikawa, Takafumi; and Masuda, Shun, 5,069,187, Cl. 173-492.000.

Nishiki, Akihiko: *See*—
Nomoto, Tsutomu; Koizumi, Masumi; and Nishiki, Akihiko, 5,070,379, Cl. 357-23.700.

Nishimiya, Masanobu: *See*—
Emoto, Masami; Nishimiya, Masanobu; and Okamoto, Akihiko, 5,070,494, Cl. 369-112.000.

Nishimura, Hiroshi: *See*—
Kimura, Akira; Kitao, Nobuo; Yasuda, Hiroshi; Shimomura, Yoshimasa; Isozaki, Kiyoshi; and Nishimura, Hiroshi, 5,069,486, Cl. 285-166.000.

Nishioka, Kyusaku: *See*—
Ikeda, Tatsuhiko; Sugahara, Kazuyuki; Kusunoki, Shigeru; and Nishioka, Kyusaku, 5,070,030, Cl. 437-31.000.

Nishitani, Nobuhisa, to Dai Nippon Insatsu Kabushiki Kaisha. Heat transfer sheet. 5,070,068, Cl. 503-227.000.

Nishiyama, Hidetomo: *See*—
Okano, Tokiyuki; Inamoto, Kiyoshi; Ohnishi, Kazuyuki; Nishiyama, Hidetomo; Sohda, Kazunori; Tokishige, Masato; and Shimazawa, Yoichi, 5,070,368, Cl. 355-246.000.

Nishiyama, Hisashi: *See*—
Osada, Koichi; Nishiyama, Hisashi; and Hirano, Akira, 5,070,230, Cl. 219-203.000.

Nissan Chemical Industries Ltd.: *See*—
Kohtoh, Noriaki; Kobayashi, Takashi; and Yukawa, Masahiko, 5,070,182, Cl. 528-353.000.

Nissan Motor Company, Limited: *See*—
Kakimoto, Toshihiko; and Murakami, Takuya, 5,069,431, Cl. 267-141.000.
Matsumoto, Eiichi; and Aruga, Tatsuo, 5,069,192, Cl. 123-572.000.
Mochida, Haruo; and Watanuki, Yoshio, 5,069,493, Cl. 292-336.300.
Sano, Takenosuke; Koike, Keiichi; Sato, Hajime; Kimura, Toshihiro; and Enokido, Yutaka, 5,070,267, Cl. 310-89.000.
Takatsuka, Hiromichi; and Kosaka, Tetsuzo, 5,070,229, Cl. 219-203.000.
Yasuno, Yoshiki, 5,070,460, Cl. 364-426.020.

Nisshinbo Industries, Inc.: *See*—
Kato, Noboru; and Fujiwara, Youichi, 5,069,313, Cl. 188-72.300.

Nissui Kako Co., Ltd.: *See*—
Okumura, Toshikata; Nakamura, Yukio; Yoneoka, Noriei; and Hachikawa, yuiti, 5,069,832, Cl. 264-23.000.

Nitta, Masayoshi: *See*—
Oyamada, Takeo; Taira, Yoshito; Nitta, Masayoshi; Kaneshima, Yasuo; Kurino, Tateshi; and Narisawa, Shizuo, 5,070,134, Cl. 524-503.000.

Nitto Boseki Co., Ltd.: *See—*
Waketa, Hideharu; Suzuki, Yoshiharu; Murakoshi, Motoharu; Kakiuchi, Hideaki; Ohgushi, Masuhito; Watanabe, Kenichi; and Sawai, Toshiya, 5,069,971, Cl. 428-391.000.

Nitto Kohki Co., Ltd.: *See—*
Kishi, Katsunobu; and Nose, Kinya, 5,069,421, Cl. 251-99.000.

Njieha, Francois K.; and Shalaby, Shalaby W., to Ethicon, Inc. Acylated epidermal growth factor. 5,070,188, Cl. 530-324.000.

Nobelpharma AB: *See—*
Rangert, Bo; Jorneus, Lars; Holmberg, Claes; and Andersson, Matts, 5,069,622, Cl. 433-173.000.

Nobumoto, Kazutoshi; Tsuyama, Toshiaki; Onaka, Toru; and Tsukahara, Yutaka, to Mazda Motor Corporation. Slip control system for a vehicle. 5,070,461, Cl. 364-426.030.

Nochi, Hideo. to NEC Corporation. Multi-output DC-DC converter using field-effect transistor switched at high frequency. 5,070,294, Cl. 323-267.000.

Noda, Hideo, to Shimano Industrial Co., Ltd. Two-bearing reel. 5,069,396, Cl. 242-321.000.

Noda, Koji: *See—*
Taniguchi, Takao; Tsukamoto, Kazumasa; Hayabuchi, Masahiro; and Noda, Koji, 5,069,657, Cl. 475-283.000.

Noda, Takashi, to Minolta Camera Kabushiki Kaisha. Image forming apparatus having a plurality of selectively operable developers. 5,070,362, Cl. 355-206.000.

Nokia Unterhaltungselektronik: *See—*
Nill, Eberhard; and Tischer, Kurt M., 5,069,733, Cl. 156-67.000.

Nolan, Garry P.; Fiering, Steven; and Herzenberg, Leonard A., to Leland Stanford Junior University, The Board of Trustees of the. Monitoring of cells and trans-activating transcription elements. 5,070,012, Cl. 435-6.000.

Nolet, Leopole: *See—*
Wippler, Heather; and Nolet, Leopole, 5,069,672, Cl. 604-385.100.

Nomoto, Tsutomu; Koizumi, Masumi; and Nishiki, Akihiko, to Oki Electric Industry Co., Ltd. Thin-film transistor matrix for active matrix display panel with alloy electrodes. 5,070,379, Cl. 357-23.700.

Nomura, Tadanori: *See—*
Yokota, Masahisa; Shimizu, Atsushi; Komiya, Kyosuke; Yamataka, Kazunori; and Nomura, Tadanori, 5,070,173, Cl. 528-85.000.

Noppel, Rene ; and Wuillemin, Kurt, to Term-ac S.A. Therapeutic device comprising a mass of a thermally active material. 5,069,208, Cl. 128-403.000.

Norand Corporation: *See—*
Mahany, Ronald L.; Sojka, Marvin L.; and West, Guy J., 5,070,536, Cl. 455-67.000.

Norbco, Inc.: *See—*
Moreau, Joseph R.; and Dyer, John J., 5,069,163, Cl. 119-27.000.

Norcini, Gabriele: *See—*
Casagrande, Cesare; Norcini, Gabriele; Santangelo, Francesco; and Semeraro, Claudio, 5,070,106, Cl. 514-651.000.

Nordica S.p.A.: *See—*
Pozzebon, Adolfo, 5,068,985, Cl. 36-117.000.

Nordischer Maschinenbau Rud. Baader GmbH & Co Kg: *See—*
Rather, Siegfried, 5,069,608, Cl. 418-261.000.

Noriyuki, Matsuoka, to Yamaichi Electric Mfg. Co., Ltd. IC removing mechanism in IC socket. 5,070,389, Cl. 357-68.000.

Normoyle, Kevin B.; Guyer, James M.; Vogt, Rainer; and Fong, Anthony S., to Data General Corporation. Floating point unit interface. 5,070,475, Cl. 395-375.000.

North American Container Corporation: *See—*
Grigsby, John M., 5,069,338, Cl. 206-319.000.

North American Philips Corp.: *See—*
Botker, Kurt, 5,070,518, Cl. 377-7.000.
Garbowicz, Glenn D.; and Perkins, Seymour, III, 5,070,279, Cl. 315-289.000.
Straka, Michael J.; and Ciancanelli, Gino J., 5,069,633, Cl. 439-271.000.

Norton Company: *See—*
Moore, Frank D.; and Dolan, Michael J., 5,069,830, Cl. 261-94.000.

Nose, Kinya: *See—*
Kishi, Katsunobu; and Nose, Kinya, 5,069,421, Cl. 251-99.000.

Novo Industri A/S: *See—*
Joergensen, Klaus, 5,070,186, Cl. 530-304.000.

Nowak, Hans D.: *See—*
Schupphaus, Dieter; and Nowak, Hans D., 5,069,328, Cl. 198-731.000.

Noyes, Lowell T.: *See—*
Holden, Homer N.; Loyer, Philip K.; Noyes, Lowell T.; and Legrady, Janos J., 5,069,635, Cl. 439-400.000.

Nozaki, Masayuki: *See—*
Seike, Shoji; Mori, Koichi; Ikeda, Mitsuji; Nozaki, Masayuki; Okajima, Hisakazu; Katsukawa, Hiroyuki; Nakanishi, Kazumi; and Doi, Kenji, 5,069,525, Cl. 385-100.000.

Nuckols, Thomas E. Dual wall well development tool. 5,069,285, Cl. 166-311.000.

Nugent, Richard M., Jr.; Ward, Thomas A.; Greigger, Paul D.; and Seiner, Jerome A., to PPG Industries, Inc. Flexible intumescent coating composition. 5,070,119, Cl. 523-179.000.

Numai, Kazuhisa: *See—*
Nakamura, Kosei; and Numai, Kazuhisa, 5,070,291, Cl. 318-771.000.

Nur, Amos M.: *See—*
Yin, Hezhu; Harris, Jerry M.; and Nur, Amos M., 5,069,308, Cl. 181-106.000.

N.V. Nederlandsche Apparatenfabriek: *See—*
Fockens, Tallienco W. H., 5,070,328, Cl. 340-825.540.

Nyce, David S., to MTS Systems Corporation. Low power magnetostrictive sensor. 5,070,485, Cl. 367-127.000.

O. S. Systems, Incorporated: *See—*
Bray, Robert D., 5,068,920, Cl. 2-21.00R.

Oba, Hidehiro: *See—*
Kato, Senji; and Oba, Hidehiro, 5,069,184, Cl. 123-422.000.

Obana, Hiroshi: *See—*
Yoshikawa, Masanori; Tateno, Haruo; Obana, Hiroshi; Itoh, Tsutomu; Saitoh, Hiroshi; and Kitoh, Masayuki, 5,070,274, Cl. 315-111.210.

Obara, Masao: *See—*
Okuyama, Nobutaka; Sakurai, Soichi; Kitou, Kouji; Ohsawa, Michitaka; Niitsu, Ichiro; Yoshioka, Hiroshi; Takeyama, Atushi; Obara, Masao; and Yoshimi, Isao, 5,070,280, Cl. 315-368.110.

Obara, Tetsuya: *See—*
Sekine, Shuji; Furuya, Takeo; and Obara, Tetsuya, 5,069,502, Cl. 296-223.000.

Obermeier, Josef; Magyari, Eugen; Ritt, Walter; Wohlwend, Ernst; Gassmann, Horst-Detlef; and Cavada, Peter, to Hilti Aktiengesellschaft. Hollow drilling tool. 5,069,584, Cl. 408-145.000.

OCA Applied Optics, Inc.: *See—*
Taylor, David F., Jr., 5,069,532, Cl. 359-56.000.

Oce Graphics France S.A.: *See—*
Gascuel, Yves J.; and Cointre, Jean-Pierre, 5,070,344, Cl. 346-1.100.

Oce-Nederland B.V.: *See—*
Schuerman, Cornelis P.; and Nauta, Gadze C., 5,070,531, Cl. 382-49.000.

OCG Microelectronic Materials, Inc.: *See—*
Roger, Robert F., 5,069,996, Cl. 430-168.000.

Ocklenburg, Matthias: *See—*
Bramsiepe, Holger; and Ocklenburg, Matthias, 5,069,091, Cl. 81-177.700.

O'Connell, Michael O. Method and apparatus for suppressing explosions and fires and preventing reignition thereof. 5,069,291, Cl. 169-66.000.

Oda, Hidemasa: *See—*
Moritani, Tohei; Fukutome, Susumu; Motoishi, Yasuo; and Oda, Hidemasa, 5,069,946, Cl. 428-36.600.

Oertley, Thomas E.: *See—*
Johnson, Mark L.; and Oertley, Thomas E., 5,069,509, Cl. 305-58.0PC.

Oestreich, Ulrich, to Siemens Aktiengeselischaft. Earth-wire overhead cable. 5,069,526, Cl. 385-101.000.

Ogasawara, Takashi: *See—*
Koide, Teruhiko; Buma, Kozi; Ogasawara, Takashi; and Shinto, Hiroaki, 5,069,479, Cl. 280-734.000.

Ogata, Yasuji, to Olympus Optical Company, Ltd. Zoom lens system. 5,069,536, Cl. 359-689.000.

Ogawa, Hiroshi; and Horimai, Hideyoshi, to Sony Corporation. Laser reproducing apparatus. 5,070,496, Cl. 369-116.000.

Ogawa, Masaharu; Nakajima, Yoshiki; Ito, Osamu; Furukawa, Teruo; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Ototake, Masafumi; and Ozaki, Minoru, to Mitsubishi Denki Kabushiki Kaisha. Signal decoding apparatus and method. 5,070,492, Cl. 369-47.000.

Ogawa, Masao, to Brother Kogyo Kabushiki Kaisha. Sewing machine for automatic thread taking-up operation. 5,069,150, Cl. 112-241.000.

Ogino, Masanori; Yamada, Takeo; and Ikeda, Miyuki, to Hitachi, Ltd. Display having automatic correction device for horizontal deflection distortion. 5,070,281, Cl. 315-370.000.

Ogura, Misami: *See—*
Inoue, Kazuo; Sano, Shoichi; Ogura, Misami; Nagahiro, Kenichi; Konno, Tsuneo; Kajiwara, Hajime; Ono, Yoshinobu; Yoshida, Suguru; Shimada, Hiroo; and Hashiguchi, Masahiro, 5,069,306, Cl. 180-291.000.

Ohad Paz: *See—*
Holland, Neta, 5,068,939, Cl. 15-22.100.

Ohara, Osamu; Takata, Hiroshi; and Kawashima, Hiroshi, to Yamaha Hatsudoki Kabushiki Kaisha. Overhead conveyor which provides increased reactive force and traction to drive wheel on ascending rail sections. 5,069,141, Cl. 105-30.000.

Ohashi, Ryota: *See—*
Sakigawa, Shigenori; Ohashi, Ryota; Shibata, Jiro; and Kawamura, Masahisa, 5,069,037, Cl. 60-435.000.

Ohba, Kaoru, to Dow Chemical Company, The. Polyamide epoxy ester resin, process for preparation thereof and coating composition. 5,070,174, Cl. 528-104.000.

O'Hearne, Robert L., to Duke Manufacturing Co. Food server. 5,069,273, Cl. 165-12.000.

Ohgushi, Masuhito: *See—*
Waketa, Hideharu; Suzuki, Yoshiharu; Murakoshi, Motoharu; Kakiuchi, Hideaki; Ohgushi, Masuhito; Watanabe, Kenichi; and Sawai, Toshiya, 5,069,971, Cl. 428-391.000.

Ohira, Sakari; Yamaki, Masatoshi; Terashima, Akira; and Ozawa, Masaaki, to Tohoku Electric Power Co., Inc.; and Kyokuto Boeki Kaisha, Ltd. System for detecting defective point on power transmission line by utilizing satellite. 5,070,537, Cl. 455-67.000.

Ohkubo, Takatoshi, to Minnesota Mining and Manufacturing Co. Binder composition for use in magnetic recording media. 5,069,807, Cl. 252-62.540.

Ohkura, Eiji: *See—*
Nakamura, Mi[illegible]i; and Ohkura, Eiji, 5,069,277, Cl. 165-173.000.

Ohmori, Akira; Inukai, Hiroshi; Kitahara, Takahiro; and Ueda, Akihiko, to Daikin Industries, Ltd. Water- and oil-repellent antifouling finishing agent. 5,069,941, Cl. 427-385.500.

Ohmori, Takashi: *See*—
Kuroda, Michio; Kirikami, Seiichi; Hisano, Katsukuni; Iizuka, Nobuyuki; Urushidani, Haruo; Sato, Isao; Ishibashi, Yoji; and Ohmori, Takashi, 5,069,029, Cl. 60-39.060.

Ohne, Teruo: *See*—
Itami, Yukio; Suzuki, Mitsuo; Ohne, Teruo; Hoshi, Kenichi; Sagae, Eiri; and Hashimoto, Yoshio, 5,069,515, Cl. 359-200.000.

Ohneda, Noboru; Ushioda, Shunta; Arima, Haruo; Hashimoto, Ichiro; Kaneko, Denziro; and Sugiyama, Kazuo, to Showa Aluminum Kabushiki Kaisha. Automatic plug-inserting apparatus in a pipe-drawing equipment. 5,069,055, Cl. 72-283.000.

Ohneda, Noboru; Ushioda, Shunta; Arima, Haruo; Hashimoto, Ichiro; Kaneko, Denziro; Sugiyama, Kazuo; Fukazawa, Tsuguo; Tachi, Teruo; and Mukasa, Takashi, to Showa Aluminum Kabushiki Kaisha. Pipe centering apparatus. 5,069,095, Cl. 82-124.000.

Ohnishi, Kazuyuki: *See*—
Okano, Tokiyuki; Inamoto, Kiyoshi; Ohnishi, Kazuyuki; Nishiyama, Hidetomo; Sohda, Kazunori; Tokishige, Masato; and Shimazawa, Yoichi, 5,070,368, Cl. 355-246.000.

Ohsawa, Michitaka: *See*—
Okuyama, Nobutaka; Sakurai, Soichi; Kitou, Kouji; Ohsawa, Michitaka; Niitsu, Ichiro; Yoshioka, Hiroshi; Takeyama, Atushi; Obara, Masao; and Yoshimi, Isao, 5,070,280, Cl. 315-368.110.

Ohsugi, Hiroharu: *See*—
Nakano, Shinji; Ohsugi, Hiroharu; Nakae, Yasuhiko; Tanabe, Hisaki; Takagawa, Ryozo; Eguchi, Yoshio; Tsutsui, Koichi; and Endo, Takeshi, 5,070,161, Cl. 526-193.000.

Ohtsuka, Kazuto: *See*—
Kazami, Kazuyuki; Daitoku, Koichi; Ezawa, Akira; Ohtsuka, Kazuto; and Inoue, Hideya, 5,070,357, Cl. 354-468.000.

Ohuchida, Hirofumi; Gofuku, Eishi; Takasago, Hayato; Ishizu, Akira; Tobita, Toshio; and Takada, Mitsuyuki, to Mitsubishi Denki Kabushiki Kaisha. Process for preparing a combined wiring substrate. 5,069,745, Cl. 156-630.000.

Ohyama, Koji; and Tsunoda, Masaki, to Nikkin Flux Inc. Method of adding silicon to aluminum. 5,069,875, Cl. 420-548.000.

Oiles Corporation: *See*—
Shirosaki, Takehiro; Kikkawa, Takashi; and Toshima, Hirotaka, 5,069,874, Cl. 420-478.000.

Oishi, Hiroshi; and Maruyama, Akira, to Sumitomo Metal Industries, Ltd. Steel sheet dip-plated with a Zn-Al alloy and process for the manufacture thereof. 5,069,981, Cl. 428-659.000.

Okada, Keiko: *See*—
Yanagita, Hiroaki; and Okada, Keiko, 5,070,506, Cl. 372-40.000.

Okada, Shinji: *See*—
Ono, Hiroaki; Ozaki, Shinji; and Okada, Shinji, 5,070,424, Cl. 360-108.000.

Okagaki, Hiroyuki, to Clarion Co., Ltd. Convolver optimum bias circuit. 5,070,472, Cl. 364-821.000.

Okajima, Hisakazu: *See*—
Seike, Shoji; Mori, Koichi; Ikeda, Mitsuji; Nozaki, Masayuki; Okajima, Hisakazu; Katsukawa, Hiroyuki; Nakanishi, Kazumi; and Doi, Kenji, 5,069,525, Cl. 385-100.000.

Okamoto, Akihiko: *See*—
Emoto, Masami; Nishimiya, Masanobu; and Okamoto, Akihiko, 5,070,494, Cl. 369-112.000.

Okamoto, Toshiyuki, to NEC Corporation. High-gain differencial amplifier circuit fabricated from field effect transistors. 5,070,306, Cl. 330-253.000.

Okamoto, Yoshihisa: *See*—
Klemarczyk, Philip T.; and Okamoto, Yoshihisa, 5,070,117, Cl. 522-31.000.

Okamura, Tadashi: *See*—
Aoki, Akira; Fujishima, Yukio; Makio, Yusuke; Kusakawa, Susumu; Tsuji, Sadaaki; and Okamura, Tadashi, 5,069,815, Cl. 252-301.360.

Okamura, Takayuki: *See*—
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 5,070,172, Cl. 528-76.000.

Okamura, Toshio, to Terumo Kabushiki Kaisha. Blood collection and/or injection device and double-ended medical needle and holder therefor. 5,069,225, Cl. 128-765.000.

Okano, Tokiyuki; Inamoto, Kiyoshi; Ohnishi, Kazuyuki; Nishiyama, Hidetomo; Sohda, Kazunori; Tokishige, Masato; and Shimazawa, Yoichi, to Sharp Kabushiki Kaisha. Developing apparatus. 5,070,368, Cl. 355-246.000.

Okazaki, Iwao; Abe, Koichi; and Nakajima, Shoji, to Toray Industries, Inc. Biaxially oriented laminated film. 5,069,962, Cl. 428-323.000.

Oki Electric Industry Co., Ltd.: *See*—
Mizutani, Minoru, 5,069,435, Cl. 271-3.000.
Nomoto, Tsutomu; Koizumi, Masumi; and Nishiki, Akihiko, 5,070,379, Cl. 357-23.700.
Shin, Yasuhiro, 5,070,255, Cl. 307-268.000.
Takizawa, Toshio; and Hirata, Hiroharu, 5,070,233, Cl. 235-380.000.

Okoshi, Noboru: *See*—
Kase, Mitsuo; Kawasaki, Yoichi; and Okoshi, Noboru, 5,070,137, Cl. 524-590.000.

Oksman, Juhani: *See*—
Chen, Xiao H.; and Oksman, Juhani, 5,070,337, Cl. 342-201.000.

Okumura, Takashi; Yamaguchi, Koshiro; and Ueda, Michio, to Brother Kogyo Kabushiki Kaisha. Thermal printer. 5,070,342, Cl. 346-76.0PH.

Okumura, Toshikata; Nakamura, Yukio; Yoneoka, Noriei; and Hachikawa, yuiti, to Kabushiki Kaisha Fujikoshi; and Nissui Kako Co., Ltd. Degating method. 5,069,832, Cl. 264-23.000.

Okumura, Toshikato: *See*—
Yokoi, Hidetoshi; Okumura, Toshikato; Nakamura, Yukio; Yoneoka, Noriei; and Hachikawa, Syuiti, 5,069,833, Cl. 264-23.000.

Okumura, Toshiyuki: *See*—
Konushi, Fumihiro; Nakatu, Hiroshi; Inoguchi, Kazuhiko; Okumura, Toshiyuki; Seki, Akinori; Takiguchi, Haruhisa; Nakanishi, Chitose; Sugahara, Satoshi; and Kudo, Hiroaki, 5,070,510, Cl. 372-46.000.

Okuyama, Nobutaka; Sakurai, Soichi; Kitou, Kouji; Ohsawa, Michitaka; Niitsu, Ichiro; Yoshioka, Hiroshi; Takeyama, Atushi; Obara, Masao; and Yoshimi, Isao, to Hitachi, Ltd.; and Hitachi Mizusawa Elec. Co Ltd. Deflection yoke. 5,070,280, Cl. 315-368.110.

Okuyama, Takashi; and Iwama, Masatoshi, to Asahi Kogaku Kogyo K.K. Optical measurement and detection system. 5,070,237, Cl. 250-227.310.

Olah, Benjamin, to California Industrial Products, Inc. Method and apparatus for forming threads on a sleeve inner wall. 5,069,051, Cl. 72-68.000.

Old Reliable Wholesale, Inc.: *See*—
Crookston, Anthony J., Sr., 5,069,950, Cl. 428-156.000.

O'Lenick, Anthony J., Jr., to Siltech Inc. Ether amine functional silicone polymers. 5,070,168, Cl. 528-10.000.

O'Lenick, Anthony J., Jr., to Siltech Inc. Phosphated silicone polymers. 5,070,171, Cl. 528-33.000.

Olganix Corporation: *See*—
Griffith, Lionell K., 5,070,454, Cl. 364-413.130.

Olin Corporation: *See*—
Canterberry, J. B.; and Murray, Terry A., 5,069,133, Cl. 102-332.000.
Holmes, Paul E.; Roberts, Katherine P.; and August, Christine M., 5,069,810, Cl. 252-174.120.
Raynor, Robert J., 5,070,200, Cl. 544-242.000.

Olympus Optical Co., Ltd.: *See*—
Komiya, Yasuhiro; and Nagasaki, Tatsuo, 5,070,353, Cl. 354-402.000.
Nishikawa, Masaji, 5,068,961, Cl. 29-825.000.
Ogata, Yasuji, 5,069,536, Cl. 359-689.000.

Omron Corporation: *See*—
Kuzukawa, Kiyoaki; and Kawamura, Chikayoshi, 5,070,315, Cl. 335-128.000.

Omure, Yukio; and Kitano, Kisuke, to Daikin Industries, Ltd. Blowing compositions. 5,070,113, Cl. 521-131.000.

Onaka, Toru: *See*—
Nobumoto, Kazutoshi; Tsuyama, Toshiaki; Onaka, Toru; and Tsukahara, Yutaka, 5,070,461, Cl. 364-426.030.

Onan Corporation: *See*—
Schmidt, Thomas A.; Overland, David A.; Huffman, Paul F.; and Nelson, Paige R., 5,069,180, Cl. 123-376.000.

Onda, Yuzi: *See*—
Saito, Masao; Tsukahara, Kengo; Takahashi, Noriko; and Onda, Yuzi, 5,070,059, Cl. 502-206.000.

Ono, Hiroaki; Ozaki, Shinji; and Okada, Shinji, to Hitachi, Ltd. Rotary drum assembly for a video tape recorder. 5,070,424, Cl. 360-108.000.

Ono, Takashi, to Orient Chemical Industries, Ltd. Organic solvent based ink composition. 5,069,719, Cl. 106-22.000.

Ono, Takayuki: *See*—
Sugimura, Kentaro; Hasimoto, Shoji; and Ono, Takayuki, 5,069,803, Cl. 252-26.000.

Ono, Yoshinobu: *See*—
Inoue, Kazuo; Sano, Shoichi; Ogura, Misami; Nagahiro, Kenichi; Konno, Tsuneo; Kajiwara, Hajime; Ono, Yoshinobu; Yoshida, Suguru; Shimada, Hiroo; and Hashiguchi, Masahiro, 5,069,306, Cl. 180-291.000.

Onoda Cement Company, Ltd.: *See*—
Yoshikawa, Masanori; Tateno, Haruo; Obana, Hiroshi; Itoh, Tsutomu; Saitoh, Hiroshi; and Kitoh, Masayuki, 5,070,274, Cl. 315-111.210.

Oohara, Takaaki: *See*—
Sasaki, Yoshikazu; Oohara, Takaaki; and Takada, Masahiko, 5,070,422, Cl. 360-85.000.

Ooms, Pieter: *See*—
Fischer, Reiner; Jensen-Korte, Uta; Kunisch, Franz; Marhold, Albrecht; Ooms, Pieter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,069,711, Cl. 71-92.000.

Oran Heating Equipment Limited: *See*—
Seidel, Pessach, 5,069,276, Cl. 165-166.000.

Orcutt, John W.: *See*—
Johnson, Richard E.; Davis, Dennis D.; Kee, David R.; Orcutt, John W.; and Hightower, Angus W., 5,070,039, Cl. 437-207.000.

Orgebin, Jean-Michel; Marty, Claude; Ansquer, Patrick; and Maroy, Pierre, to Compagnie de Raffinage et de Distribution Total France. Procedure for the fixed-bed sweetening of petroleum fractions. 5,069,777, Cl. 208-207.000.

Orient Chemical Industries, Ltd.: *See*—
Ono, Takashi, 5,069,719, Cl. 106-22.000.

Oriez, Robert; and Gras, Elie, to Anver. Method for high frequency molding of liquid plastic material. 5,069,835, Cl. 264-26.000.

Orlowski, David C., to Inpro Companies, Inc. Static and dynamic shaft seal assembly. 5,069,461, Cl. 277-25.000.

Orr, Thomas V., to Proctor & Gamble Company, The. Antiperspirant creams. 5,069,897, Cl. 424-66.000.

Osada, Koichi; Nishiyama, Hisashi; and Hirano, Akira, to Asahi Glass Company Ltd. Electrically heatable windshield. 5,070,230, Cl. 219-203.000.

Osaka-Fu: *See*—
Aoki, Akira; Fujishima, Yukio; Makio, Yusuke; Kusakawa, Susumu; Tsuji, Sadaaki; and Okamura, Tadashi, 5,069,815, Cl. 252-301.360.

Oshinsky, Candace. Combined scent and audio point of sale display unit. 5,069,876, Cl. 422-4.000.

Ostertag, Reinhard F.: *See*—
Ostertag, Ulrich K.; and Ostertag, Reinhard F., 5,069,249, Cl. 137-625.400.

Ostertag, Ulrich K.; and Ostertag, Reinhard F., to Hansa Metallwerke AG. Sanitary fitting. 5,069,249, Cl. 137-625.400.

Ota, Kazuya: *See*—
Komatsu, Koichiro; Mizutani, Hideo; Magome, Nobutaka; and Ota, Kazuya, 5,070,250, Cl. 250-548.000.

Ota, Yoshifumi: *See*—
Nakamura, Kyuzo; Ota, Yoshifumi; Ishikawa, Michio; Tani, Noriaki; Hashimoto, Masanori; and Murata, Yuzo, 5,069,983, Cl. 428-694.000.

Otis Elevator Company: *See*—
Iwasa, Masao; and Mori, Masayuki, 5,070,290, Cl. 318-758.000.
Iwasa, Masao; and Kito, Yasutami, 5,070,426, Cl. 361-91.000.

Otis Engineering Corporation: *See*—
Kilgore, Marion D., 5,069,242, Cl. 137-155.000.

Ototake. Masafumi: *See*—
Ogawa, Masaharu; Nakajima, Yoshiki; Ito, Osamu; Furukawa, Teruo; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Ototake, Masafumi; and Ozaki, Minoru, 5,070,492, Cl. 369-47.000.

Otsuka Kagaku Kabushiki Kaisha: *See*—
Sasaoka, Michio; Saito, Nori; Shiroi, Takashi; Nagao, Shigemitsu; Kikuchi, Ryo; and Kameyama, Yutaka, 5,070,194, Cl. 540-214.000.

Outboard Marine Corporation: *See*—
Westberg, Tom; and Mattiazzi, Joseph A., 5,069,643, Cl. 440-77.000.

Output Technology Corporation: *See*—
Bacus, Michael W.; Price, Dick T.; Lewis, Dale A.; Demarchi, Michael E.; Homa, Karl L. C.; McInturff, Gary; and Gruell, Robert, 5,070,231, Cl. 219-216.000.

Ouwerkerk, Anton V.: *See*—
Narula, Anubhav P. S.; De Virgilio, John J.; Benaim, Carlos; Ouwerkerk, Anton V.; and Gillotin, Olivier, 5,070,073, Cl. 512-13.000.

Overland, David A.: *See*—
Schmidt, Thomas A.; Overland, David A.; Huffman, Paul F.; and Nelson, Paige R., 5,069,180, Cl. 123-376.000.

Owens, Alan R.: *See*—
Bartelt, James T.; Harris, Frank W.; and Owens, Alan R., 5,069,211, Cl. 128-421.000.

Oxenrider, Bryce C.; Long, David J.; and Mares, Frank, to Allied-Signal Inc. Copolymerization of vinyl acetate and a fluoromonomer in an aqueous medium. 5,070,162, Cl. 526-216.000.

Oxy-Tuben AB: *See*—
Larsson, Arne, 5,069,616, Cl. 431-267.000.

Oxycal Laboratories, Inc.: *See*—
Markham, Richard G., 5,070,085, Cl. 514-161.000.

Oyamada, Takeo; Taira, Yoshito; Nitta, Masayoshi; Kaneshima, Yasuo; Kurino, Tateshi; and Narisawa, Shizuo, to Sumitomo Chemical Co., Ltd. Vinyl acetate-ethylene copolymer emulsion and process for producing the same. 5,070,134, Cl. 524-503.000.

Ozaki, Ernie T.: *See*—
Chu, Ruey S.; Wong, Nam S.; and Ozaki, Ernie T., 5,070,339, Cl. 343-700.0MS.

Ozaki, Minoru: *See*—
Ogawa, Masaharu; Nakajima, Yoshiki; Ito, Osamu; Furukawa, Teruo; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Ototake, Masafumi; and Ozaki, Minoru, 5,070,492, Cl. 369-47.000.

Ozaki, Shinji: *See*—
Ono, Hiroaki; Ozaki, Shinji; and Okada, Shinji, 5,070,424, Cl. 360-108.000.

Ozaki, Tatsuhiko; Wada, Hirotaka; and Sugiura, Fumitoshi. Graft copolymers effective as additives to unsaturated polyester resins. 5,070,147, Cl. 525-285.000.

Ozawa, Masaaki: *See*—
Ohira, Sakari; Yamaki, Masatoshi; Terashima, Akira; and Ozawa, Masaaki, 5,070,537, Cl. 455-67.000.

Ozeki, Jiro, to Slidex Corporation. Sailing boat model adapted for exhibition and for sailing on the water. 5,069,648, Cl. 446-160.000.

Ozeki, Tomotaka: *See*—
Uetani, Yoshio; Ozeki, Tomotaka; and Ishida, Kazuo, 5,069,989, Cl. 429-164.000.

Packard, Mark A.: *See*—
Hasan, Syed R.; Packard, Mark A.; and Ditka, Michael P., 5,069,588, Cl. 411-439.000.

Paddock, Eugene T., to E. T. Paddock Enterprises, Inc. Wheel channel guide-lock for gymnasium bleachers. 5,069,007, Cl. 52-9.000.

Padi, Gyula. Working point adjusting circuit for a power amplifier. 5,070,308, Cl. 330-268.000.

Palazzo, Raymond E., Jr.: *See*—
Miller, Steven L.; Wathen, Ronald L.; and Palazzo, Raymond E., Jr., 5,069,785, Cl. 210-232.000.

Palmaer, Eric K.: *See*—
Palmaer, Karl V.; and Palmaer, Eric K., 5,069,330, Cl. 198-778.000.

Palmaer, Karl V.; and Palmaer, Eric K. Side plate for a plastic spiral conveyor belt system. 5,069,330, Cl. 198-778.000.

Palumbo, Anthony C., Jr.: *See*—
Hatwar, Tukaram K.; Palumbo, Anthony C., Jr.; and Stinson, Douglas G., 5,069,984, Cl. 428-694.000.

Pankove, Jacques I., to University of Colorado Foundation, Inc. Method and apparatus for semiconductor circuit chip cooling. 5,070,040, Cl. 437-209.000.

Panttila, Vaino ; and Villgren, Voitto, to Valmet Oy. Drive unit for the reel-up of a paper machine or paper finishing machine. 5,069,394, Cl. 242-67.10R.

Paradis, Joseph R. Dental appliance. 5,069,621, Cl. 433-147.000.

Parfondry, Alain: *See*—
Watts, Arun; Muller, Louis; Verhelst, Gabriel; De Witte, Mireille; Pham, Tu; and Parfondry, Alain, 5,070,114, Cl. 521-159.000.

Pariza, Michael W.; and Ha, Yeong L., to Wisconsin Alumni Research Foundation. Methods of chelating metal and novel compositions therefor. 5,070,104, Cl. 514-549.000.

Parr, Timothy J.; and Hungerink, Gerald W., to Holland Hitch Company. Electronically controlled fluid release fifth wheel safety mechanism. 5,069,472, Cl. 280-433.000.

Parrini, Paolo: *See*—
Pizzigoni, Giuseppe; and Parrini, Paolo, 5,069,811, Cl. 252-174.140.

Parsons, Linda M.; Bopp, Lawrence; Waring, Alfred L.; and Shayegani, Mehdi, to Health Research Inc. DNA probes for the detection of *Haemophilus Ducreyi* and method of use. 5,070,011, Cl. 435-6.000.

Pascher, Reinhard, to Neil Pryde Limited. Harness. 5,069,153, Cl. 114-39.200.

Pass, Reinhard: *See*—
Romey, Ingo; and Pass, Reinhard, 5,069,795, Cl. 210-652.000.

Pasta, Vallabhdas M.: *See*—
Callaghan, Thomas M.; Pasta, Vallabhdas M.; Kale, Vasant D.; and Bruce, Charles A., 5,069,822, Cl. 252-511.000.

Pastor, Ricardo C.; and Gorre, Luisa E., to Hughes Aircraft Company. Preparation of fluoride glass by chemical vapor deposition. 5,069,701, Cl. 65-18.200.

Patel, Jayantilal S., to Bell Communications Research, Inc. Electrically controlled polarization-independent liquid crystal fresnel lens. 5,069,813, Cl. 252-299.010.

Patel, Kishor J.: *See*—
Stobbs, Thomas J.; and Patel, Kishor J., 5,069,420, Cl. 251-30.020.

Pathier, Pierre: *See*—
Commissaire, Henri; Pathier, Pierre; and Sirven, Jacques, 5,070,334, Cl. 342-43.000.

Pathway Systems, Inc.: *See*—
Pierson, Eric D., 5,069,236, Cl. 134-153.000.

Patil, Prabhakar B.; Miller, John M.; and Masrur, Md. A., to Ford Motor Company. Fail-safe variable damping suspension for a motor vehicle. 5,070,284, Cl. 318-362.000.

Paton, Boris E.; Podgaetsky, Vladimir V.; Varenchuk, Pavel A.; Privalov, Nikolai T.; Galinich, Vladimir I.; Kovalev, Valentin D.; and Romanenko, Yaroslav A., to Institut Elekctrosvarki Imeni E. O. Patona Akademii Nauk Ukrainskoi SSR. Method for overhead submerged arc welding and apparatus to implement the same. 5,070,225, Cl. 219-73.000.

Patte, Jean-Francois: *See*—
Bense, Pierre; and Patte, Jean-Francois, 5,069,578, Cl. 404-75.000.

Patterson, Timothy P.; Hoge, Carl E.; and Baia, Joseph, to Western Digital Corporation. Plated plastic castellated interconnect for electrical components. 5,069,626, Cl. 439-55.000.

Paudice, Ciro: *See*—
Leone, Massimo; and Paudice, Ciro, 5,069,852, Cl. 264-171.000.

Paul, Robert A.: *See*—
DeSantis, Dominick A.; and Paul, Robert A., 5,069,816, Cl. 252-315.500.

Pavlicek, Heinz: *See*—
Grote, Dieter; Muller, Fritz; and Pavlicek, Heinz, 5,069,839, Cl. 264-63.000.

Paz-Pujalt, Gustavo R.: *See*—
Mir, Jose M.; Agostinelli, John A.; Peterson, David L.; Paz-Pujalt, Gustavo R.; Higberg, Brian J.; and Rajeswaran, Gopalan, 5,070,072, Cl. 505-1.000.

PCC Airfoils, Inc.: *See*—
Blazek, William S., 5,069,265, Cl. 164-35.000.

Peacock, Steve N. Milk hose support. 5,069,159, Cl. 119-14.100.

Peat, Elas D. Educational play structure. 5,069,623, Cl. 434-260.000.

Peccoux, Pierre-Michael; and Schorsch, Gilbert, to Rhone-Poulenc Chimie. Two-package RTV organopolysiloxanes comprising a water-retaining polymer. 5,070,132, Cl. 524-492.000.

Pedretti, Ugo: *See*—
Liu, Ming-de; Bresci, Bruno; Magagnini, Pier L.; Maurizi, Nicoletta; Pedretti, Ugo; and Roggero, Arnaldo, 5,070,155, Cl. 525-432.000.

Peerless Chain Company: *See*—
Blankenship, David J.; George, Richard A.; and Czaplewski, Steven E., 5,068,948, Cl. 24-115.00A.

Peinze, Reinhold, to Rekuerator KG Dr.-Ing. Schack & Co. Process for removering desorbate produced in the desorption of laden sorption material, and apparatus therefor. 5,069,038, Cl. 62-18.000.

Penoza, Frank J. Cutting tool. 5,069,872, Cl. 420-436.000.

Penven, Paul; Michel, Philippe; Jerome, Denis; and Moradpour, Alexandre, to Thomson CSF. Organic material with extremely narrow electron spin resonance line and gaussmeter probe or magnetometer using this material. 5,070,214, Cl. 556-64.000.

Pera, Anne, to Gascoigne-Melotte B.V. Teat catcher for a milking machine and a process for milking by using such a teat catcher. 5,069,161, Cl. 119-14.470.

Perdue, Thomas E., Jr.: *See—*
Hart, Richard S.; and Perdue, Thomas E., Jr., 5,068,945, Cl. 16-114.00B.

Perez, Jose M.: *See—*
Allen, William C.; Pye, Stephen D.; Hamblin, Gerald M.; Perez, Jose M.; Amend, William E.; Bush, John D.; Holligan, David; and Pyle, Delbert E., 5,069,485, Cl. 285-55.000.

Perfect Fastener, Inc.: *See—*
Chen, Nathan, 5,069,050, Cl. 70-456.00R.

Performance Controls, Inc.: *See—*
Goff, Jerry K., 5,070,292, Cl. 318-811.000.

Perkins Manufacturing Company: *See—*
Zelinka, Robert F.; and Redding, John W., 5,069,593, Cl. 414-408.000.

Perkins, Seymour, III: *See—*
Garbowicz, Glenn D.; and Perkins, Seymour, III, 5,070,279, Cl. 315-289.000.

Perry, Stuart D.; and Chandler, Jasper S., to Eastman Kodak Company. Driving circuit for double solenoid focus actuator. 5,070,489, Cl. 369-44.160.

Perzborn, Elisabeth: *See—*
Mohrs, Klaus; Perzborn, Elisabeth; Seuter, Friedel; Fruchtmann, Romanis; and Kohlsdorfer, Christian, 5,070,096, Cl. 514-311.000.

Pesce, Sergio, to Minnesota Mining and Manufacturing Company. Cassette with intensifying screens to be used with an X-ray film. 5,070,248, Cl. 250-483.100.

Peters, Norman K.; Frost, John W.; and Long, Sharon R., to Leland Stanford Junior University, The Board of Trustees of the. Method of controlling gene expression. 5,070,018, Cl. 435-172.300.

Peterson, Alan B.: *See—*
Kaiser, Jeffrey L.; Wright, David L.; Hegedus, Denes A.; and Peterson, Alan B., 5,070,512, Cl. 372-65.000.

Peterson, David L.: *See—*
Mir, Jose M.; Agostinelli, John A.; Peterson, David L.; Paz-Pujalt, Gustavo R.; Higberg, Brian J.; and Rajeswaran, Gopalan, 5,070,072, Cl. 505-1.000.

Petit-Collin, Jean-Marc: *See—*
Boutier, Philippe; Petit-Collin, Jean-Marc; Plebani, Dany-Ange; Mathivat, Denis; and Machura, Christophe, 5,069,704, Cl. 65-106.000.

Petrovic, John J.; Honnell, Richard E.; and Gibbs, W. Scott, to University of California. Molybdenum disilicide alloy matrix composite. 5,069,841, Cl. 264-86.000.

Petuch, Brian R.; Chen, Shieh-Shung T.; Inamine, Edward S.; and White, Raymond F., to Merck & Co., Inc. Novel avermectins are produced from known microorganisms. 5,070,015, Cl. 435-42.000.

Pfaudler Companies, Inc., The: *See—*
Amorese, Franklyn J.; and Gruver, Morris E., III, 5,069,423, Cl. 251-144.000.

Pfiester, James R.; and Hayden, James D., to Motorola, Inc. Semiconductor process using selective deposition. 5,070,029, Cl. 437-29.000.

Pfister, Larry E.: *See—*
Modrowski, Thomas A.; Pfister, Larry E.; Raybuck, Gregory A.; and Stoddart, James O., 5,069,762, Cl. 205-137.000.

Pfizer Hospital Products Groups, Inc.: *See—*
Radovich, John M.; and Schofield, Richard W., 5,069,788, Cl. 210-321.800.

Pfizer Inc.: *See—*
Cooper, Melvin; Fray, Michael J.; Richardson, Kenneth; and Steele, John, 5,070,205, Cl. 548-333.000.

Phalen, John W.: *See—*
Gorzegno, Walter P.; Abdulally, Iqbal F.; Phalen, John W.; and Touma, Alfred S., 5,069,170, Cl. 122-4.00D.

Pham, Tu: *See—*
Watts, Arun; Muller, Louis; Verhelst, Gabriel; De Witte, Mireille; Pham, Tu; and Parfondry, Alain, 5,070,114, Cl. 521-159.000.

Phelon, Russell D.; and Brunelle, Ronald G., to R. E. Phelon Company, Inc. Rotor of a magnetomotive device. 5,070,268, Cl. 310-153.000.

Philipp Holzmann Aktiengsellschaft: *See—*
Fischer, Joachim; and Muonning, Andreas, 5,069,725, Cl. 134-42.000.

Phillippi, R. Michael, to Vesuvius Crucible Company. Protective sheath for a continuous measurement thermocouple. 5,069,553, Cl. 374-140.000.

Phillips, Emyr: *See—*
Braig, Adalbert; Meier, Hans-Rudolf; Leppard, David G.; Wasson, Robert C.; and Phillips, Emyr, 5,069,805, Cl. 252-47.500.

Phillips Petroleum Company: *See—*
Bailey, Fay W., 5,070,129, Cl. 524-399.000.
Brown, Ronald E., 5,069,757, Cl. 203-51.000.

Phoenix Medical Technology: *See—*
Mixon, Grover C.; and Morrison, Willard L., 5,069,907, Cl. 424-445.000.

Pierce, James M.: *See—*
Cohen, Robert S.; Pierce, James M.; and Kinsey, William H., 5,069,906, Cl. 424-430.000.

Pierson, Eric D., to Pathway Systems, Inc. Method and apparatus for cleaning disks. 5,069,236, Cl. 134-153.000.

Pillsbury Company, The: *See—*
Graf, Ernst; Karel, Marcus; and Saguy, Israel A., 5,069,918, Cl. 426-243.000.

Pinckney, Linda R., to Corning Incorporated. Brightly colored canasite glass-ceramics. 5,070,044, Cl. 501-3.000.

Pinkney, Barry D., to Def-Tec Corporation. Flameless expulsion grenade. 5,069,134, Cl. 102-368.000.

Pinkus, Alan R., to United States of America, Air Force. Night vision goggle ambient illumination testing. 5,070,239, Cl. 250-252.100.

Pioneer Electronic Corporation: *See—*
Kitazawa, Hideki; Terada, Ryohei; Takeuchi, Shogo; Kayama, Tsutomu; Tanimoto, Kohichi; Utsugi, Nobuo; and Nagai, Yoshiaki, 5,070,431, Cl. 362-31.000.
Nakada, Hitoshi; Wakimoto, Takeo; Shinkai, Masanao; and Matsunaga, Daisaku, 5,069,975, Cl. 428-457.000.

Pitney Bowes Inc.: *See—*
Schuricht, Jurgen; and Zeiss, Armin, 5,070,463, Cl. 364-464.020.

Pizzigoni, Giuseppe; and Parrini, Paolo, to Larac S.p.A. Compositions for the sulphation-removing cleaning of carbonatic lithoidal surfaces. 5,069,811, Cl. 252-174.140.

PKL Verpackungssystems GmbH: *See—*
Farber, Jurgen, 5,069,385, Cl. 229-137.000.

Plaas-Link, Andreas. Process for separating substances present in liquids. 5,069,768, Cl. 204-180.100.

Plath, Peter: *See—*
Meyer, Norbert; Shirmer, Ulrich; Plath, Peter; Wuerzer, Bruno; and Westphalen, Karl-Otto, 5,069,708, Cl. 71-90.000.

Plebani, Dany-Ange: *See—*
Boutier, Philippe; Petit-Collin, Jean-Marc; Plebani, Dany-Ange; Mathivat, Denis; and Machura, Christophe, 5,069,704, Cl. 65-106.000.

Plewes, Donald B.: *See—*
Stein, Jay A.; Plewes, Donald B.; Gershman, Russell J.; Liebau, James G.; and Williams, John N., 5,070,519, Cl. 378-146.000.

Plexiform, Incorporated: *See—*
Dehart, David L., 5,069,344, Cl. 206-508.000.

Pliml, Jr., Frank V., to Illinois Tool Works Inc. Casement window fastening system. 5,069,013, Cl. 52-214.000.

Podgaetsky, Vladimir V.: *See—*
Paton, Boris E.; Podgaetsky, Vladimir V.; Varenchuk, Pavel A.; Privalov, Nikolai T.; Galinich, Vladimir I.; Kovalev, Valentin D.; and Romanenko, Yaroslav A., 5,070,225, Cl. 219-73.000.

Podszun, Wolfgang: *See—*
Muller, Michael; Podszun, Wolfgang; and Winkel, Jens, 5,070,165, Cl. 526-301.000.

Polczynski, Mark H., to Thor Technology Corporation. Oximeter sensor assembly with integral cable and encoder. 5,069,213, Cl. 128-633.000.

Polesello, Mario: *See—*
Masi, Francesco; Moalli, Angelo; Invernizzi, Renzo; Menconi, Francesco; Ferrero, Cesare; Malquori, Stefano; Barazzoni, Lia; and Polesello, Mario, 5,070,051, Cl. 502-9.000.

Polston, Henry B.: *See—*
Sheppard, Sheron R.; and Polston, Henry B., 5,068,940, Cl. 15-104.310.

Polysar Financial Services S.A.: *See—*
Aboul-Nasr, Osman T., 5,069,750, Cl. 159-2.001.

Pomero, Claude, to Les Profiles du Centre. Road safety barrier. 5,069,576, Cl. 404-6.000.

Pona, Joseph, Jr., to Allied-Signal Inc. Miniature tactical angular rate sensor. 5,070,289, Cl. 318-640.000.

Popp, Konrad J.: *See—*
Topfer, Klaus; and Popp, Konrad J., 5,070,224, Cl. 219-69.120.

Porter, Charles R.: *See—*
Huggins, Raymond W.; and Porter, Charles R., 5,069,547, Cl. 356-374.000.

Ports, Kenneth A.: *See—*
Wade, William R.; and Ports, Kenneth A., 5,070,388, Cl. 357-68.000.

Porucznik, Paul; and Longstaff, Keith, to CMB Foodcan plc. Method for roll forming and apparatus for carrying out the method. 5,069,052, Cl. 72-84.000.

Posin, Jack, to Telectronics Pacing Systems, Inc. Electrical terminal. 5,069,209, Cl. 128-419.00P.

Posner, Barry I.; and Fantus, I. George. Vanadium-peroxide compositions as insulin mimickers. 5,069,913, Cl. 424-646.000.

Poss, Glen T.: *See—*
Rosengrant, Brent L.; Poss, Glen T.; and Maccabee, Malcolm M., 5,069,469, Cl. 280-288.100.

Possati, Mario; and Golinelli, Guido, to Marposs Societa' per Azioni. Apparatus for checking dimensions of workpieces. 5,068,974, Cl. 33-549.000.

Potter, Terry C., to Tolco Corporation. Mixing valve. 5,069,245, Cl. 137-218.000.

Poulsen, Don K., to Halliburton Company. Methods for design and analysis of subterranean fractures using net pressures. 5,070,457, Cl. 364-420.000.

Powazinik, William: *See—*
Rideout, William C.; Holmstrom, Roger P.; Eichen, Elliot; Powazinik, William; LaCourse, Joanne; Schlafer, John; and Lauer, Robert B., 5,069,561, Cl. 385-14.000.

Powell, Cynthia. Pool cover storage apparatus. 5,068,928, Cl. 4-500.000.

Power Lone Star, Inc.: *See—*
Muszynski, Larry C., 5,069,255, Cl. 138-149.000.

Pozzebon, Adolfo, to Nordica S.p.A. Inner shoe particularly for ski boots. 5,068,985, Cl. 36-117.000.

Pozzo, Michel L., to Ateliers de Conceptions et d'Innovations Industrielles. Article for diffusing volatile substances, and in particular perfume. 5,069,877, Cl. 422-4.000.

PPG Industries, Inc.: *See*—
Nugent, Richard M., Jr.; Ward, Thomas A.; Greigger, Paul D.; and Seiner, Jerome A., 5,070,119, Cl. 523-179.000.

Pradinas, Claude: *See*—
Salmon, Pierre; and Pradinas, Claude, 5,069,367, Cl. 222-153.000.

Prassas, Thomas N.; and Bard, Shannon, to Aquapore Moisture Systems. Porous pipe landscape system. 5,069,388, Cl. 239-145.000.

Premiere De Tabbah SA: *See*—
Mejias, Andre , 5,069,045, Cl. 63-3.000.

Price, Dick T.: *See*—
Bacus, Michael W.; Price, Dick T.; Lewis, Dale A.; Demarchi, Michael E.; Homa, Karl L. C.; McInturff, Gary; and Gruell, Robert, 5,070,231, Cl. 219-216.000.

Priebe, Gordon W., to Honeywell Inc. Integrated circuit interconnections testing. 5,070,296, Cl. 324-73.100.

Priem, Curtis; and Malachowsky, Chris, to Sun Microsystems, Inc. Apparatus for write handshake in high-speed asynchronous bus interface. 5,070,443, Cl. 395-725.000.

Prince Corporation: *See*—
Suman, Michael J.; and Dykstra, Jonathan A., 5,070,434, Cl. 362-74.000.

Prince, Paul R.; and Callaway, William D., to Baxter International Inc. Adaptive filter flow control system and method. 5,069,792, Cl. 210-627.000.

Pringle, Richard C., to Hughes Aircraft Company. Radar guidance system correcting hardware induced channel-to-channel phase errors. 5,070,336, Cl. 342-151.000.

Privalov, Nikolai T.: *See*—
Paton, Boris E.; Podgaetsky, Vladimir V.; Varenchuk, Pavel A.; Privalov, Nikolai T.; Galinich, Vladimir I.; Kovalev, Valentin D.; and Romanenko, Yaroslav A., 5,070,225, Cl. 219-73.000.

Prochaska, Sr., John J.; and Wright, Joseph M., to Modtech Industries, Inc. Aquatic vegetation harvester. 5,069,023, Cl. 56-9.000.

Prock, Steven D. Ankle brace. 5,069,202, Cl. 128-80.00H.

Proctor & Gamble Company, The: *See*—
Orr, Thomas V., 5,069,897, Cl. 424-66.000.

Progress Water Technologies Corp.: *See*—
Matonte, Philip J., 5,069,883, Cl. 422-269.000.

Prokes, Jiri: *See*—
Hladky, Vaclav; and Prokes, Jiri, 5,069,054, Cl. 72-238.000.

Proprietary Technology, Inc.: *See*—
Bartholomew, Donald D., 5,069,489, Cl. 285-319.000.

Propst, Robert L. Cart assembly. 5,069,466, Cl. 280-79.300.

Prossel, Gunther: *See*—
Gitzel, Jorg; Macholdt, Hans-Tobias; Sieber, Alexander; Wehowsky, Frank; and Prossel, Gunther, 5,069,994, Cl. 430-110.000.

Protor Co.: *See*—
Medina, Victor; Stracher, Alfred; and Kesner, Leo, 5,070,074, Cl. 514-3.000.

PRR Industries, Inc.: *See*—
Holum, Ronald L.; Brown, Patrick M.; and DeWall, Ronald L., 5,069,044, Cl. 62-320.000.

Prufrex-Elektro-Apparatebau Inh. Helga Muller geb. Dutschke: *See*—
Erhard, Werner, 5,069,193, Cl. 123-602.000.

Pryor, Jeffrey W.: *See*—
Pryor, John W.; and Pryor, Jeffrey W., 5,069,570, Cl. 403-109.000.

Pryor, John W.; and Pryor, Jeffrey W., to Pryor Products. Snubber for telescoping tubes. 5,069,570, Cl. 403-109.000.

Pryor Products: *See*—
Pryor, John W.; and Pryor, Jeffrey W., 5,069,570, Cl. 403-109.000.

Przybysz, John X., to Westinghouse Electric Corp. Method for forming refractory resistors with etch stop for superconductor integrated circuits. 5,069,748, Cl. 156-643.000.

Pucci, Mark S.; Shida, Mitsu; Machonis, John, Jr.; and Jachec, Kevin, to Morton International, Inc. Adhesive blend of polyolefins and grafted block copolymer of polystyrene. 5,070,143, Cl. 525-74.000.

Puett, Cecil E., to Sunclipse, Inc. Open loading skin packaging machine. 5,069,018, Cl. 53-427.000.

Pulek, John L., to Cuno, Incorporated. Filter apparatus snap lock cartridge retainer. 5,069,786, Cl. 210-232.000.

Pulwer, Mitchell J.: *See*—
Miller, William; and Pulwer, Mitchell J., 5,070,204, Cl. 546-321.000.

Pye, Stephen D.: *See*—
Allen, William C.; Pye, Stephen D.; Hamblin, Gerald M.; Perez, Jose M.; Amend, William E.; Bush, John D.; Holligan, David; and Pyle, Delbert E., 5,069,485, Cl. 285-55.000.

Pyle, Delbert E.: *See*—
Allen, William C.; Pye, Stephen D.; Hamblin, Gerald M.; Perez, Jose M.; Amend, William E.; Bush, John D.; Holligan, David; and Pyle, Delbert E., 5,069,485, Cl. 285-55.000.

Pyle, Kenneth E. Automatic umpire for slow pitch softball. 5,069,450, Cl. 273-25.000.

Quaker Oats Company, The: *See*—
Hanson, Steven P.; and Williams, Bartley E., 5,069,646, Cl. 446-85.000.
Keyser, William L.; Medrow, Ronald K.; and Milling, Thomas E., 5,069,917, Cl. 426-243.000.

Quality Microcircuits Corporation: *See*—
Stevens, E. Henry, 5,070,036, Cl. 437-190.000.

Quebec Metal Powders Limited: *See*—
Gosselin, Francis, 5,069,714, Cl. 75-252.000.

R. E. Phelon Company, Inc.: *See*—
Phelon, Russell D.; and Brunelle, Ronald G., 5,070,268, Cl. 310-153.000.

R. M. Wieland Company: *See*—
Wieland, Roy M., 5,069,506, Cl. 297-440.000.

Rabe, Duane C.: *See*—
Hietala, Alexander W.; and Rabe, Duane C., 5,070,310, Cl. 331-1.00A.

Radex-Heraklith Industriebeteiligungs Aktiengesellschaft: *See*—
Steinwender, Reinhold, 5,069,015, Cl. 52-575.000.

Radiant Technologies: *See*—
Evans, Joseph T., Jr.; and Bullington, Jeff A., 5,070,385, Cl. 357-51.000.

Radius Inc.: *See*—
Faul, Jerome F.; and Nguyen, Julien T., 5,070,532, Cl. 382-56.000.

Radon Testing Corporation of America: *See*—
Wiblin, Claude M., 5,070,247, Cl. 250-472.100.

Radovich, John M.; and Schofield, Richard W., to Pfizer Hospital Products Groups, Inc. Multi-pass blood washing and plasma removal device and method. 5,069,788, Cl. 210-321.800.

Ragless, Clive L., to Industrial Pyrometers (Aust.) Pty. Ltd.; and Commonwealth Scientific and Industrial Research Organisation, The. Ceramic coated wires and thermocouples. 5,069,726, Cl. 136-201.000.

Raijo, Mitsuyuki: *See*—
Arai, Tetsuzo; Yamamoto, Yasushi; Raijo, Mitsuyuki; and Fujita, Isao, 5,069,929, Cl. 427-54.100.

Rajeswaran, Gopalan: *See*—
Mir, Jose M.; Agostinelli, John A.; Peterson, David L.; Paz-Pujalt, Gustavo R.; Higberg, Brian J.; and Rajeswaran, Gopalan, 5,070,072, Cl. 505-1.000.

Ralphco, Inc.: *See*—
Dworman, Ralph M.; and Dworman, Nancy S., 5,069,645, Cl. 446-8.000.

Ramachandran, P.: *See*—
Joshi, David P.; Ramachandran, P.; and Soriano, Zenaida B., 5,069,825, Cl. 252-533.000.

Ramberg, Charles H.: *See*—
Malecek, Edward L.; and Ramberg, Charles H., 5,069,062, Cl. 73-49.700.

Ramono, Ralph. Alarm system. 5,070,320, Cl. 340-539.000.

Rampe, John F., to Jepmar Research. System for drivingly connecting gears, pulleys, wheels, rollers and other apertured components to shafts. 5,069,654, Cl. 474-161.000.

Ranbaxy Laboratories Limited: *See*—
Khanna, Jag M.; Kumar, Naresh; Bala, Kiran; and Kumar, Yatendra, 5,070,195, Cl. 540-218.000.

Ranco Incorporated of Delaware: *See*—
Scuka, Rodney W., 5,070,319, Cl. 340-384.00E.

Rancon, Yannick; and Duchateau, Eric, to l'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process for heat treating metals in a continuous oven under controlled atmosphere. 5,069,728, Cl. 148-16.000.

Randall, Ken: *See*—
Dennany, Robert, Jr.; and Randall, Ken, 5,069,424, Cl. 251-149.600.

Randall, Kent A., to Eastman Kodak Company. Method and apparatus for handling toner images. 5,070,371, Cl. 355-272.000.

Randall, Kent A., to Eastman Kodak Company. Method and apparatus of forming combined toner images. 5,070,372, Cl. 355-272.000.

Rangert, Bo; Jorneus, Lars; Holmberg, Claes; and Andersson, Matts, to Nobelpharma AB. Spacer. 5,069,622, Cl. 433-173.000.

Rank Cintel Limited: *See*—
Wedderburn-Bisshop, Thomas, 5,070,397, Cl. 358-22.000.

Rantala, Borje T.; and Weckstrom, Kurt P., to Instrumentarium Corporation. Apparatus and method for the identification of gases. 5,070,245, Cl. 250-343.000.

Ranz, Stephen J.: *See*—
Maber, John W.; and Ranz, Stephen J., 5,070,499, Cl. 370-61.000.

Rasshofer, Werner: *See*—
Wagner, Joachim; Elsner, Thomas; Rasshofer, Werner; Faehndrich, Jurgen; and Jurgens, Eberhard, 5,069,857, Cl. 264-544.000.

Rather, Siegfried, to Nordischer Mashinenbau Rud. Baader GmbH & Co Kg. Vane pump for delivering pasty substances. 5,069,608, Cl. 418-261.000.

Rattan, Lanham P.: *See*—
Hafer, George F.; and Rattan, Lanham P., 5,070,523, Cl. 379-94.000.

Ray Harvey Company, Inc.: *See*—
Sheppard, Sheron R.; and Polston, Henry B., 5,068,940, Cl. 15-104.310.

Raybuck, Gregory A.: *See*—
Modrowski, Thomas A.; Pfister, Larry E.; Raybuck, Gregory A.; and Stoddart, James O., 5,069,762, Cl. 205-137.000.

Raychem Corporation: *See*—
Dupon, Ryan W.; Thompson, Mark S.; Wiseman, Gary H.; Musolf, Douglas J.; and Tanous, Adam C., 5,070,050, Cl. 501-108.000.
Shimirak, Gerald L.; Chan, Paul S.; Kay, John; Croce, Jim; Huynh, Van L.; Swinmurn, John; and Bierlein, Eric, 5,069,636, Cl. 439-412.000.

Raycher, Robert J.; and Cangro, Ronald A., to Erico Fastening Systems, Inc. Interactive stud welding gun. 5,070,226, Cl. 219-98.000.

Rayfield, Jerry W.: *See*—
Nicols, Carl W.; Lorang, Michael J.; Wold, Michael O.; and Rayfield, Jerry W., 5,069,346, Cl. 209-700.000.

Raymond: *See*—
Avitan, Isaac, 5,070,283, Cl. 318-139.000.

Raynet Corporation: *See*—
Kohy, Lowell I.; and Kaczorowski, Damian, 5,069,516, Cl. 350-96.100.

Raynor, Robert J., to Olin Corporation. Process for the preparation of chloroamines. 5,070,200, Cl. 544-242.000.

Redding, John W.: *See*—
Zelinka, Robert F.; and Redding, John W., 5,069,593, Cl. 414-408.000.
Reed, Larry N. Gunstock storage assembly. 5,068,991, Cl. 42-71.010.
Reese, Cecil E.: *See*—
Grindstaff, Teddy H.; and Reese, Cecil E., 5,069,844, Cl. 264-103.000.
Grindstaff, Teddy H.; and Reese, Cecil E., 5,069,845, Cl. 264-103.000.
Grindstaff, Teddy H.; and Reese, Cecil E., 5,069,846, Cl. 264-103.000.
Reger, Ronald K.: *See*—
Leisure, Ronald K.; Larsen, Oya F.; and Reger, Ronald K., 5,070,037, Cl. 437-195.000.
Rehau AG & Co.: *See*—
Hopperdietzel, Siegfried, 5,069,947, Cl. 428-38.000.
Rehle, Alfred: *See*—
Stohr, Albert; and Rehle, Alfred, 5,069,327, Cl. 198-725.000.
Reichl, Erwin: *See*—
Harz, Gerhard; and Reichl, Erwin, 5,070,428, Cl. 361-341.000.
Reid, Kenneth J., to University of Minnesota, Regents of the. Direct smelting process and apparatus. 5,069,715, Cl. 75-414.000.
Reider, Paul J.: *See*—
Hughes, David L.; Reider, Paul J.; Amato, Joseph S.; Bergan, James J.; and Grabowski, Edward J. J., 5,070,022, Cl. 435-280.000.
Reihl, Peter; Fuerst, Arpad; Wingen, Bernhard; Schmid, Alfred; Schreiter, Thomas; and Haendler, Erich, to Webasto AG Fahrzeugtechnik. Ventilation roof for vehicles. 5,069,500, Cl. 296-214.000.
Reik, Wolfgang; and Elison, Hans-Dieter, to Luk Lamellen und Kupplungsbau GmbH. Torque transmitting and torsion damping apparatus for use in motor vehicles. 5,069,321, Cl. 192-70.170.
Reil, Wilhelm; Deutschbein, Ulrich; and Liebram, Udo, to Tetra Pak Holding & Finance S.A. Apparatus for producing a fluids package. 5,069,021, Cl. 53-563.000.
Reilly, James L.: *See*—
Bohen, Joseph M.; and Reilly, James L., 5,070,124, Cl. 524-151.000.
Reinson, Lorne R.; Akerman, Mark J.; and Klippenstein, John, to Lens-O-Matic Inc. Device for storage and insertion of contact lenses. 5,069,494, Cl. 294-1.200.
Reising, William S. Device for holding a glass workpiece while shaping. 5,069,432, Cl. 269-3.000.
Rekuerator KG Dr.-Ing. Schack & Co.: *See*—
Peinze, Reinhold, 5,069,038, Cl. 62-18.000.
Remelman, G. Mark: *See*—
Marquez, Al H.; Way, James A.; and Remelman, G. Mark, 5,069,116, Cl. 99-330.000.
Rempfer, William C.; and Dobkin, Robert C., to Linear Technology Corporation. Constant current, highspeed, auto-zeroed, CMOS comparator. 5,070,259, Cl. 307-350.000.
Remson, Joseph D., to Rolm Corporation. DC to DC converter apparatus employing push-pull oscillators. 5,070,439, Cl. 363-22.000.
Renk Aktiengesellschaft: *See*—
Muller, Hans; and Trapp, Joachim, 5,069,559, Cl. 384-277.000.
Renz, Rainer: *See*—
Kramer, Johann; and Renz, Rainer, 5,069,179, Cl. 123-270.000.
Research Development Corporation of Japan: *See*—
Sakai, Hiroyuki, 5,070,375, Cl. 357-4.000.
Reuter, Wolfgang; and Gediga, Josef, to Leybold Aktiengesellschaft. Lifting and turning unit for a melting and/or casting plant. 5,069,269, Cl. 164-325.000.
Revlon, Inc.: *See*—
Goldberg, Marvin E., 5,069,898, Cl. 424-70.000.
Revolution Fuels of America, Inc.: *See*—
Hallberg, David E., 5,070,016, Cl. 435-132.000.
Rey, Giorgio A., to Italimpianti of America, Inc. Hydrostatic bearing support of strip. 5,069,158, Cl. 118-410.000.
Reynolds, James R., to Milliken Research Corporation. Apparatus for producing sealed edge knit wiping cloths. 5,069,735, Cl. 156-497.000.
Rhoades, John J.: *See*—
Holoubek, George H.; and Rhoades, John J., 5,069,856, Cl. 264-519.000.
Rhodes, Bruce R.; Bollinger, Dave; and Dombrowski, Mark, to General Signal Corporation. Computer controlled standby power supply system. 5,070,251, Cl. 307-46.000.
Rhodes, Robert B.; Eckert, Rudolf J.; and Loeffler, Donald E., to Shell Oil Company. Gear oil viscosity index improvers. 5,070,131, Cl. 524-484.000.
Rhone Poulenc Agrochimie, S.A.: *See*—
Barlet, Denis, 5,070,083, Cl. 514-144.000.
Rhone-Poulenc Chimie: *See*—
Gay, Michel, 5,070,128, Cl. 524-357.000.
Peccoux, Pierre-Michael; and Schorsch, Gilbert, 5,070,132, Cl. 524-492.000.
Rhow, Harold: *See*—
Wang, Lawrence K.; Wang, Mu H. S.; Hwang, Chong S.; and Rhow, Harold, 5,069,783, Cl. 210-196.000.
Riberio Pinto, Luiz Antonio C. D., to Santal Equipamentos S/A Comercio E. Industria. Cleaning device for harvested sugar cane or similar products. 5,069,024, Cl. 56-12.800.
Rice, John: *See*—
Grennan, Robert; Rice, John; and Squier, Steven, 5,069,692, Cl. 55-158.000.
Richards, Charlie W. Fuel treatment methods, compositions and devices. 5,069,190, Cl. 123-538.000.
Richardson, Kenneth: *See*—
Cooper, Melvin; Fray, Michael J.; Richardson, Kenneth; and Steele, John, 5,070,205, Cl. 548-333.000.
Richmond, Robert L.; and Robinson, Michael, to Active Voice, Inc. Signal analyzing system. 5,070,526, Cl. 379-372.000.
Richter, Johan C. F. C., to Kamyr AB. Digester screen switching. 5,069,752, Cl. 162-37.000.
Ricoh Company, Ltd.: *See*—
Emoto, Masami; Nishimiya, Masanobu; and Okamoto, Akihiko, 5,070,494, Cl. 369-112.000.
Furushima, Tadashi, 5,070,324, Cl. 340-706.000.
Itami, Yukio; Suzuki, Mitsuo; Ohne, Teruo; Hoshi, Kenichi; Sagae, Eiri; and Hashimoto, Yoshio, 5,069,515, Cl. 359-200.000.
Kitajima, Tomoya; and Suzuki, Akira, 5,069,543, Cl. 356-4.000.
Nakamura, Yoshio; Shinohara, Junichi; and Kishida, Daisuke, 5,070,356, Cl. 354-439.000.
Ricoult, Daniel L. G.: *See*—
Comte, Marie J. M.; Netter, Paul L.; and Ricoult, Daniel L. G., 5,070,045, Cl. 501-4.000.
Rideout, William C.; Holmstrom, Roger P.; Eichen, Elliot; Powazinik, William; LaCourse, Joanne; Schlafer, John; and Lauer, Robert B., to GTE Laboratories Incorporated. Monolithically integrated ridge waveguide semiconductor optical preamplifier. 5,069,561, Cl. 385-14.000.
Riederer, Rudolf, to Gurit-Essex AG. Gap sealing means. 5,069,012, Cl. 52-208.000.
Rieper, Wolfgang: *See*—
Dietz, Erwin; Sommer, Andreas; Kroh, Adolf; Hohn, Jurgen; Hafner, Otmar; and Rieper, Wolfgang, 5,070,159, Cl. 525-504.000.
Riker Laboratories, Inc.: *See*—
Smith, David K.; and Wass, Anthony C. L., 5,069,204, Cl. 128-200.230.
Rinehart, John R., to American Institute of Taxidermy, Inc. Floating tip-up fishing rig with swivel fishing bobbin. 5,068,995, Cl. 43-17.000.
Ripmeester, John A.: *See*—
Majid, Abdul; and Ripmeester, John A., 5,070,081, Cl. 514-58.000.
Risdon Corporation: *See*—
McGarvey, Glenn W., 5,069,369, Cl. 222-321.000.
Ritchie, David G. Photocatalytic fluid purification apparatus having helical nontransparent substrate. 5,069,885, Cl. 422-186.000.
Ritt, Walter: *See*—
Obermeier, Josef; Magyari, Eugen; Ritt, Walter; Wohlwend, Ernst; Gassmann, Horst-Detlef; and Cavada, Peter, 5,069,584, Cl. 408-145.000.
Ritter, Charles H. Method and apparatus for removing debris from between and around teeth. 5,069,233, Cl. 132-322.000.
Ritter, Jochen: *See*—
Hussla, Ingo; and Ritter, Jochen, 5,069,930, Cl. 427-55.000.
Robbins, John L.: *See*—
Hsu, Edward C.; and Robbins, John L., 5,070,064, Cl. 502-325.000.
Roberson, Linda K.; and Mackey, Suzanne. Child's safety harness. 5,069,168, Cl. 119-96.000.
Robert Bosch GmbH: *See*—
Babitzka, Rudolf, 5,069,834, Cl. 264-24.000.
Haubner, Georg; and Zobl, Hartmut, 5,070,481, Cl. 365-228.000.
Van Zanten, Anton; Ruf, Wolf-Dieter; Kost, Friedrich; and Weiss, Karl-Josef, 5,070,459, Cl. 364-426.020.
Zillgitt, Ulrich; Speer, Harald; Haug, Kurt; Ebinger, Georg; Millers, Miervaldis; and Hasselmann, Heinrich, 5,070,433, Cl. 362-66.000.
Robert, Franz-Josef: *See*—
Barlage, Bruno; Robert, Franz-Josef; and Gattermann, Bernd, 5,069,294, Cl. 172-49.500.
Barlage, Bruno; and Robert, Franz-Josef, 5,069,295, Cl. 172-123.000.
Robert Schroder, Firma: *See*—
Bramsiepe, Holger; and Ocklenburg, Matthias, 5,069,091, Cl. 81-177.700.
Roberts, Gordon J.: *See*—
Gardner, Robert D.; Hopp, Dineen M.; Shaikh, Aziz S.; and Roberts, Gordon J., 5,070,047, Cl. 501-16.000.
Roberts, Joseph M., Sr. Electrical light for underwater use. 5,070,437, Cl. 362-158.000.
Roberts, Katherine P.: *See*—
Holmes, Paul E.; Roberts, Katherine P.; and August, Christine M., 5,069,810, Cl. 252-174.120.
Robertson, J. Richard; Su, Kai C.; Goldenberg, Merrill S.; and Mueller, Karl F., to Ciba-Geigy Corporation. Wettable, flexible, oxygen permeable contact lens containing block copolymer polysiloxane-polyoxyalkylene backbone units and use thereof. 5,070,169, Cl. 528-25.000.
Robertson, J. Richard; and Su, Kai C., to Ciba-Geigy Corporation. Wettable, rigid gas permeable, substantially non-swellable contact lens containing block copolymer polysiloxane-polyoxyalkylene backbone units, and use thereof. 5,070,170, Cl. 528-25.000.
Robinette, Susan; Mammino, Joseph; Carmichael, Kathleen M.; Tokoli, Emery G.; Lynch, Anita P.; and Yu, Robert C. U., to Xerox Corporation. Photoreceptor layers containing polydimethylsiloxane copolymers. 5,069,993, Cl. 430-58.000.
Robinson, Michael: *See*—
Richmond, Robert L.; and Robinson, Michael, 5,070,526, Cl. 379-372.000.
Robinson, Paul R., to Commonwealth of Australia, The. Target for close in weapon systems. 5,069,399, Cl. 244-14.000.

Rochester Medical Devices, Inc.: *See*—
Maronian, Hovaness, 5,069,227, Cl. 128-844.000.
Rodman, Clarke A.: *See*—
Largman, Theodore; Mares, Frank; and Rodman, Clarke A., 5,069,970, Cl. 428-373.000.
Rodriguez, Roberto: *See*—
Zhu, Ming-De; Rodriguez, Roberto; and Wehr, C. Timothy, 5,069,766, Cl. 204-180.100.
Rody, Jean; and Leppard, David G., to Ciba-Geigy AG. Color photographic materials comprising phenolic thiane derivatives as light and thermal oxidation stabilizers. 5,070,007, Cl. 430-551.000.
Roensch, L. Frederick; Chang, Kelvin Y.; and Tanner, Clarence T., to Mogul Corporation, The. Method for prevention of well fouling. 5,069,286, Cl. 166-312.000.
Roger, Robert F., to OCG Microelectronic Materials, Inc. Process for developing selected positive photoresists. 5,069,996, Cl. 430-168.000.
Rogers, Brian; and Maczulak, Anne, to Gillette Company, The. Malodor inhibiting skin deodorant composition comprising a monoclonal antibody and method of deodorizing. 5,069,896, Cl. 424-65.000.
Rogers, James H.: *See*—
Farrell, Richard B.; and Rogers, James H., 5,069,513, Cl. 312-201.000.
Roggero, Arnaldo: *See*—
Liu, Ming-de; Bresci, Bruno; Magagnini, Pier L.; Maurizi, Nicoletta; Pedretti, Ugo; and Roggero, Arnaldo, 5,070,155, Cl. 525-432.000.
Rohm GmbH: *See*—
Langerbeins, Klaus, 5,070,061, Cl. 502-211.000.
Rohm and Haas Company: *See*—
Sherba, Samuel E.; and Mehta, Rai J., 5,069,717, Cl. 106-18.350.
Rohrbaugh, Dennis K.: *See*—
Bartram, Philip W.; DiBona, Noel C.; Buchanan, James H.; and Rohrbaugh, Dennis K., 5,069,797, Cl. 210-690.000.
Rollerblade: *See*—
Malewicz, Andrzej M., 5,068,956, Cl. 29-437.000.
Rolm Corporation: *See*—
Remson, Joseph D., 5,070,439, Cl. 363-22.000.
Romanauskas, William A.: *See*—
Carson, David M.; and Romanauskas, William A., 5,069,413, Cl. 248-638.000.
Romanenko, Yaroslav A.: *See*—
Paton, Boris E.; Podgaetsky, Vladimir V.; Varenchuk, Pavel A.; Privalov, Nikolai T.; Galinich, Vladimir I.; Kovalev, Valentin D.; and Romanenko, Yaroslav A., 5,070,225, Cl. 219-73.000.
Romey, Ingo; and Pass, Reinhard, to Bergwerksverband GmbH. Process for separating hydrocarbons from waste water. 5,069,795, Cl. 210-652.000.
Roos, Eric J.: *See*—
Sharma, Kuldeepak; Roy, Samir D.; and Roos, Eric J., 5,069,909, Cl. 424-449.000.
Roozekrans, Christianus J.: *See*—
van den Bogert, Willem J.; Roozekrans, Christianus J.; and Wanninkhof, Markus W. M., 5,070,273, Cl. 313-607.000.
Rosa, Fred C.: *See*—
Chin, James; Marshall, James B.; Drozdick, Michael D.; Rosa, Fred C.; and Judge, Fraderick D., 5,070,197, Cl. 544-11.000.
Roscoe, Frederick. Self-leveling platform for loading docks. 5,068,938, Cl. 14-71.700.
Rosengrant, Brent L.; Poss, Glen T.; and Maccabee, Malcolm M., to H.P.E. Corporation. Recumbent cycle. 5,069,469, Cl. 280-288.100.
Rosenthal, Dov, to De Haan Mechatronics B.V. Linear actuator. 5,069,076, Cl. 74-89.150.
Ross, Linda. Shoulder pad assembly. 5,068,924, Cl. 2-268.000.
Rossi, Carlo: *See*—
Meloni, Stefano; and Rossi, Carlo, 5,068,937, Cl. 8-158.000.
Rotex, Inc.: *See*—
Lower, William E.; and Mitchell, Stephen C., 5,069,778, Cl. 209-323.000.
Roth, Andreas: *See*—
Chrobaczek, Martin; Denz, Helmut; Roth, Andreas; and Heim, Hans, 5,069,063, Cl. 73-118.200.
Rotwein, Peter S.; and Krivi, Gwen G., to Washington University. Human preproinsulin-like growth factor I. 5,070,075, Cl. 514-12.000.
Rousseau, Victor. Livestock feeder system. 5,069,165, Cl. 119-57.600.
Roy, Samir D.: *See*—
Sharma, Kuldeepak; Roy, Samir D.; and Roos, Eric J., 5,069,909, Cl. 424-449.000.
Rubber Industries, Ltd.: *See*—
Nakasaki, Eiji; Shirashoji, Hisashi; Hoshikawa, Katsuyuki; Kamijo, Takao; Ikeda, Kazushige; Inoue, Yasuhiro; and Kato, Takeo, 5,069,262, Cl. 152-536.000.
Rubber Waste, Inc.: *See*—
Ulick, Thomas J.; and Carner, William E., 5,070,109, Cl. 521-41.000.
Rudolf, Dieter: *See*—
Becker, Hans F.; and Rudolf, Dieter, 5,069,791, Cl. 210-344.000.
Rudolph, Dietrich; and Steinemer, Norbert, to Siemens Aktiengesellschaft. Actuating mechanism for a vacuum-type interrupter with a contact spring. 5,069,077, Cl. 74-102.000.
Rudolph E. Krueger, Inc.: *See*—
Krueger, R. Ernst, deceased; and Krueger, William E., 5,069,297, Cl. 175-65.000.
Ruegg, Hans: *See*—
Frey, Ruedi; and Ruegg, Hans, 5,069,886, Cl. 423-237.000.
Ruemeli, Roberg; and Heitzler, Gerard, to Kaysersberg Packaging, S.A. Process and device for applying a protective film to an alveolated board. 5,069,738, Cl. 156-444.000.
Ruf, Max; and Korostenski, Erwin, to Audi AG. Internal combustion engine. 5,069,176, Cl. 123-193.00H.
Ruf, Wolf-Dieter: *See*—
Van Zanten, Anton; Ruf, Wolf-Dieter; Kost, Friedrich; and Weiss, Karl-Josef, 5,070,459, Cl. 364-426.020.
Ruggieri, Roberto: *See*—
Bertola, Aldo; and Ruggieri, Roberto, 5,069,687, Cl. 55-44.000.
Ruggiero, Joseph. Invalid's bathtub seat. 5,068,930, Cl. 4-560.000.
Russ, Werner H.: *See*—
Schlafer, Ludwig; and Russ, Werner H., 5,070,189, Cl. 534-642.000.
Russell, Robert H.: *See*—
Snyderman, Fredric; and Russell, Robert H., 5,069,447, Cl. 272-123.000.
Rutherford, Howard J., to International Flavors & Fragrances Inc. Method for imparting functional ingredients, functional ingredient-imparting articles and methods for preparation and use thereof. 5,069,231, Cl. 131-335.000.
Rutkowski, Stephen F.: *See*—
Siemers, Paul A.; and Rutkowski, Stephen F., 5,070,228, Cl. 219-121.460.
Ryder Truck Rental, Inc.: *See*—
Clelland, William F., 5,069,497, Cl. 296-155.000.
S.A.R.L. "Matiba-Manufactures de Tissus": *See*—
Vandermeersch, Edmond, 5,069,957, Cl. 428-230.000.
Sabel, Inc.: *See*—
Levine, Peter, 5,069,732, Cl. 156-71.000.
Sachsenwerk Aktiengesellschaft: *See*—
Harz, Gerhard; and Reichl, Erwin, 5,070,428, Cl. 361-341.000.
Safe Medical Devices Inc.: *See*—
Gericke, Stephen H., 5,069,666, Cl. 604-86.000.
Safi, Syed H.: *See*—
Harris, Ivor R.; and Safi, Syed H., 5,069,713, Cl. 75-232.000.
Sagae, Eiri: *See*—
Itami, Yukio; Suzuki, Mitsuo; Ohne, Teruo; Hoshi, Kenichi; Sagae, Eiri; and Hashimoto, Yoshio, 5,069,515, Cl. 359-200.000.
Sagami, Shigeru: *See*—
Ibuka, Shigehito; Kondo, Hisashi; Sagami, Shigeru; and Sumi, Koji, 5,070,275, Cl. 315-111.810.
Saguy, Israel A.: *See*—
Graf, Ernst; Karel, Marcus; and Saguy, Israel A., 5,069,918, Cl. 426-243.000.
Sahira, Kensho: *See*—
Kida, Michio; and Sahira, Kensho, 5,069,741, Cl. 156-617.100.
Saint-Gobain Vitrage: *See*—
d'Iribarne, Benoit; Kuster, Hans-Werner; and Vanaschen, Luc, 5,069,703, Cl. 65-104.000.
Saint-Gobain Vitrage International: *See*—
Boutier, Philippe; Petit-Collin, Jean-Marc; Plebani, Dany-Ange; Mathivat, Denis; and Machura, Christophe, 5,069,704, Cl. 65-106.000.
Letemps, Bernard; and Leclercq, Jacques, 5,069,705, Cl. 65-289.000.
St. Romain, Thomas E. Turf plug catcher. 5,069,293, Cl. 172-22.000.
Saito, Chitoshi, to Sanshin Kogyo Kabushiki Kaisha. Fuel injector system for internal combustion engine. 5,069,189, Cl. 123-533.000.
Saito, Hiromitsu: *See*—
Kanda, Yutaka; Uosaki, Youichi; Saito, Hiromitsu; Sano, Hiroshi; Kobayashi, Eiji; Morimoto, Makoto; and Nagamura, Satoru, 5,070,092, Cl. 514-253.000.
Saito, Katsuhisa: *See*—
Kitazumi, Satoshi; and Saito, Katsuhisa, 5,070,432, Cl. 362-61.000.
Saito, Masao; Tsukahara, Kengo; Takahashi, Noriko; and Onda, Yuzi, to Mitsubishi Gas Chemical Company, Inc. Catalyst for producing aromatic nitriles. 5,070,059, Cl. 502-206.000.
Saito, Nori: *See*—
Sasaoka, Michio; Saito, Nori; Shiroi, Takashi; Nagao, Shigemitsu; Kikuchi, Ryo; and Kameyama, Yutaka, 5,070,194, Cl. 540-214.000.
Saito, Osamu; and Sumiya, Kenji, to Hitachi Maxell, Ltd. Magnetic recording medium. 5,069,973, Cl. 428-421.000.
Saitoh, Hiroshi: *See*—
Yoshikawa, Masanori; Tateno, Haruo; Obana, Hiroshi; Itoh, Tsutomu; Saitoh, Hiroshi; and Kitoh, Masayuki, 5,070,274, Cl. 315-111.210.
Saitoh, Takashi; and Fukui, Kohji, to Tokico Ltd. Scroll fluid machine having a sealing member radially inwardly of a thrust bearing. 5,069,605, Cl. 418-55.200.
Sakagami, Masaharu: *See*—
Matsui, Tetsuya; Kitamori, Takehiko; Yokose, Kenji; and Sakagami, Masaharu, 5,070,300, Cl. 324-464.000.
Sakai, Hiroyuki, to Research Development Corporation of Japan. Semiconductor device having a coupled quantum box array structure. 5,070,375, Cl. 357-4.000.
Sakai, Takashi: *See*—
Kuzuya, Susumu; Shimizu, Seiji; Kato, Mikio; Ishikawa, Yujiro; Sakai, Takashi; and Yuki, Eiji, 5,069,557, Cl. 400-120.000.
Sakama, Mitsunori: *See*—
Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, 5,069,531, Cl. 359-55.000.
Sakamoto, Hiroyuki; Tobinaga, Kenshiro; and Tsuchiya, Yasuyuki, to Nippon Paint Co., Ltd. Aqueous dispersion of cationic crosslinked

resin particles from resin having at least two vinyl groups. 5,070,120, Cl. 523-412.000.

Sakamoto, Shunji; and Hoshino, Toshihiko, to Mazda Motor Corp. Conveyor means. 5,069,326, Cl. 198-619.000.

Sakamoto, Yukio; Hori, Toshio; and Fukutani, Iwao, to Murata Manufacturing Co., Ltd. Modular jack. 5,069,641, Cl. 439-620.000.

Sakashita, Shigeo, to Casio Computer Co., Ltd. Electronic musical instrument with musical tone parameter switching function. 5,069,106, Cl. 84-626.000.

Sakashita, Shigeo, to Casio Computer Co., Ltd. Electronic musical instrument in which a musical tone is controlled in accordance with a digital signal. 5,069,107, Cl. 84-659.000.

Sakigawa, Shigenori; Ohashi, Ryota; Shibata, Jiro; and Kawamura, Masahisa, to Kanzaki Kokyukoki Mfg. Co., Ltd. Fluid supply system for vehicles. 5,069,037, Cl. 60-435.000.

Sakuda, Shohei: *See*—
Yamada, Yasuhiro; Sakuda, Shohei; and Takayama, Seiji, 5,070,191, Cl. 536-22.000.

Sakurai, Akira; and Torimae, Yasuhiro, to Kao Corporation. Absorbent article. 5,069,677, Cl. 604-370.000.

Sakurai, Soichi: *See*—
Okuyama, Nobutaka; Sakurai, Soichi; Kitou, Kouji; Ohsawa, Michitaka; Niitsu, Ichiro; Yoshioka, Hiroshi; Takeyama, Atushi; Obara, Masao; and Yoshimi, Isao, 5,070,280, Cl. 315-368.110.

Salem, James B., to Thinking Machines Corporation. Method of simulating a hexagonal array of computer processors and/or memories. 5,070,446, Cl. 395-500.000.

Salib, Mike L.; and Cohn, Marvin, to United States of America, Air Force. Distributed combiner power amplifier and method. 5,070,304, Cl. 330-54.000.

Salibi, S. Kamal. Foot flush adaptor. 5,068,925, Cl. 4-249.000.

Salmon, Pierre; and Pradinas, Claude, to Societe Nouvelle de Bouchons Plastiques. Pouring stopper with tear-off guarantee strip with a separate diaphragm. 5,069,367, Cl. 222-153.000.

Salomon S.A.: *See*—
Baud, Philippe M.; and Bourgeois, Frederic P., 5,069,463, Cl. 280-14.200.

Salvati, Jon R.; and Lia, Raymond A., to Welch Allyn, Inc. Video measurement system with automatic calibration and distortion correction. 5,070,401, Cl. 358-107.000.

Samaras, George M.; Falk, Steven M.; and Blaumanis, Otis R., to GMS Engineering Corporation. Flash reflectance oximeter. 5,069,214, Cl. 128-633.000.

Sameshima, Kenji: *See*—
Kikawa, Takeshi; Tsuji, Kazutaka; Sameshima, Kenji; Hirai, Tadaaki; Yamazaki, Junichi; Kubota, Misao; and Shidara, Keiichi, 5,070,272, Cl. 313-386.000.

SamSung Electronics Co., Ltd.: *See*—
Jin, Dae-Je, 5,070,038, Cl. 437-200.000.

Samukawa, Koji: *See*—
Seki, Masaki; Samukawa, Koji; and Hanaoka, Osamu, 5,070,464, Cl. 364-474.340.

San Shing Hardware Works Co., Ltd.: *See*—
Lee, Yuan-Ho, 5,069,057, Cl. 72-405.000.

Sanders, Nicholas A.: *See*—
Luo, Lifeng; Sanders, Nicholas A.; and Couch, Richard W., Jr., 5,070,227, Cl. 219-121.550.

Sandhu, Gurtej S.; Schultz, Laurence D.; and Doan, Trung T., to Micron Technology, Inc. Apparatus for endpoint detection during mechanical planarization of semiconductor wafers. 5,069,002, Cl. 51-165.00R.

Sandoz Ltd.: *See*—
Zuger, Othmar, 5,069,911, Cl. 424-469.000.

Sanfilippo, James J.: *See*—
Sanfilippo, John E.; and Sanfilippo, James J., 5,069,020, Cl. 53-510.000.

Sanfilippo, John E.; and Sanfilippo, James J. Apparatus for providing containers with a controlled environment. 5,069,020, Cl. 53-510.000.

Sangroniz, James: *See*—
Beaufort, Richard; Sangroniz, James; and Cox, Darrell, 5,070,529, Cl. 361-415.000.

Sano, Hiroshi: *See*—
Kanda, Yutaka; Uosaki, Youichi; Saito, Hiromitsu; Sano, Hiroshi; Kobayashi, Eiji; Morimoto, Makoto; and Nagamura, Satoru, 5,070,092, Cl. 514-253.000.

Sano, Kunihiko: *See*—
Yasunaga, Tadashi; Kaneko, Shiro; and Sano, Kunihiko, 5,069,933, Cl. 427-130.000.

Sano, Shoichi: *See*—
Inoue, Kazuo; Sano, Shoichi; Ogura, Misami; Nagahiro, Kenichi; Konno, Tsuneo; Kajiwara, Hajime; Ono, Yoshinobu; Yoshida, Suguru; Shimada, Hiroo; and Hashiguchi, Masahiro, 5,069,306, Cl. 180-291.000.

Sano, Takenosuke; Koike, Keiichi; Sato, Hajime; Kimura, Toshihiro; and Enokido, Yutaka, to Calsonic Corporation; and Nissan Motor Co., Ltd. Low-noise electric motor assembly for automotive blower. 5,070,267, Cl. 310-89.000.

Sanshin Kogyo Kabushiki Kaisha: *See*—
Kanno, Isao, 5,069,174, Cl. 123-179.160.
Kobayashi, Seiji; and Miyazaki, Masaharu, 5,069,644, Cl. 440-77.000.
Saito, Chitoshi, 5,069,189, Cl. 123-533.000.

Santa Barbara Research Center: *See*—
Jack, Michael D., 5,070,241, Cl. 250-336.200.

Santal Equipamentos S/A Comercio E. Industria: *See*—
Riberio Pinto, Luiz Antonio C. D., 5,069,024, Cl. 56-12.800.

Santangelo, Francesco: *See*—
Casagrande, Cesare; Norcini, Gabriele; Santangelo, Francesco; and Semeraro, Claudio, 5,070,106, Cl. 514-651.000.

Santel, Hans-Joachim: *See*—
Draber, Wilfried; Babczinsky, Peter; Santel, Hans-Joachim; Lurssen, Klaus; and Schmidt, Robert R., 5,069,712, Cl. 71-92.000.
Fischer, Reiner; Jensen-Korte, Uta; Kunisch, Franz; Marhold, Albrecht; Ooms, Pieter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,069,711, Cl. 71-92.000.

Sanyo Electric Co., Ltd.: *See*—
Kouzuma, Shinichi; Inoue, Hiroshi; Murata, Kenji; Tanaka, Hiroyuki; and Kishi, Yasuo, 5,069,727, Cl. 136-251.000.
Koyama, Hiroshi, 5,070,447, Cl. 395-725.000.
Sasaki, Yoshikazu; Oohara, Takaaki; and Takada, Masahiko, 5,070,422, Cl. 360-85.000.

Saruwatari, Masumi; Tsuji, Syoichi; and Fujii, Yasuhiro, to Mitsui Toatsu Chemicals, Inc. Extrusion process of polyimide and polyimide pellet used for the process. 5,069,848, Cl. 264-118.000.

Sasaki, Hideki; Matsuoka, Shinji; and Yamamoto, Akihiko, to Hitachi, Ltd. Method for correcting drift of printing position and printing apparatus for practising the same. 5,069,556, Cl. 400-74.000.

Sasaki, Hiroyuki, to Japan Aviation Electronics Industry Limited. Method of fabricating a fiber optic coupler. 5,069,518, Cl. 385-43.000.

Sasaki, Yoshikazu; Oohara, Takaaki; and Takada, Masahiko, to Sanyo Electric Co., Ltd. Magnetic tape back tension device for magnetic recording-reproduction system. 5,070,422, Cl. 360-85.000.

Sasaoka, Michio; Saito, Nori; Shiroi, Takashi; Nagao, Shigemitsu; Kikuchi, Ryo; and Kameyama, Yutaka, to Otsuka Kagaku Kabushiki Kaisha. Method for production of β-lactam derivatives. 5,070,194, Cl. 540-214.000.

Sasatani, Tomohiko: *See*—
Ishii, Yoshiki; Shimokoriyama, Makoto; Shimizu, Tetsuya; Yoshimura, Katsuji; Fujii, Akio; and Sasatani, Tomohiko, 5,070,402, Cl. 358-135.000.

Sata, Nobuyuki: *See*—
Tamaki, Jun; and Sata, Nobuyuki, 5,070,269, Cl. 310-171.000.

Sato, Hajime: *See*—
Sano, Takenosuke; Koike, Keiichi; Sato, Hajime; Kimura, Toshihiro; and Enokido, Yutaka, 5,070,267, Cl. 310-89.000.

Sato, Hidemi: *See*—
Fukushima, Atsuko; Hira, Yasuo; Sato, Hidemi; Kawamoto, Kazumi; Ito, Kenchi; Shiba, Masataka; and Arimoto, Akira, 5,070,488, Cl. 360-44.120.

Sato, Isao: *See*—
Kuroda, Michio; Kirikami, Seiichi; Hisano, Katsukuni; Iizuka, Nobuyuki; Urushidani, Haruo; Sato, Isao; Ishibashi, Yoji; and Ohmori, Takashi, 5,069,029, Cl. 60-39.060.

Sato, Kunihito: *See*—
Yonekawa, Takashi; Buma, Shuuichi; Aburaya, Toshio; Sato, Kunihito; Kawanishi, Masaki; Hamada, Toshiaki; and Tagawa, Shinichi, 5,069,475, Cl. 280-707.000.

Sato, Masa-aki; and Yamauchi, Aizo, to Agency of Industrial Science and Technology; and Ministry of International Trade & Industry. Thiophene compound and method for production thereof. 5,069,823, Cl. 252-518.000.

Satoh, Kazushi: *See*—
Tsumura, Hiroshi; Mutoh, Kiyoyuki; Satoh, Kazushi; and Isobe, Ken-ichi, 5,070,175, Cl. 528-12.000.

Satoh, Masaru: *See*—
Masaki, Mitsuo; Yamakawa, Tomio; Satoh, Masaru; Takeda, Hiromitsu; Yoshino, Yasushi; and Matsukura, Hitoshi, 5,070,089, Cl. 514-255.000.
Masaki, Mitsuo; Satoh, Masaru; Moritoh, Naoya; Hashimoto, Koichi; Kamishiro, Toshiro; and Shinozaki, Haruhiko, 5,070,196, Cl. 540-450.000.

Satoh, Tamotsu; Yonehara, Takao; and Nakamura, Yoshio, to Canon Kabushiki Kaisha. Process for producing a semiconductor memory device. 5,070,034, Cl. 437-52.000.

Satou, Mitsugi: *See*—
Kishikawa, Nobutaka; Mita, Akira; and Satou, Mitsugi, 5,069,953, Cl. 428-201.000.

Saulnier, Raymond: *See*—
Nicolas, Jean-Claude; and Saulnier, Raymond, 5,069,869, Cl. 419-28.000.

Sauter, Jurgen: *See*—
Gerum, Johannes; Schulz, Horst; and Sauter, Jurgen, 5,069,931, Cl. 427-128.000.

Sawai, Toshiya: *See*—
Waketa, Hideharu; Suzuki, Yoshiharu; Murakoshi, Motoharu; Kakiuchi, Hideaki; Ohgushi, Masuhito; Watanabe, Kenichi; and Sawai, Toshiya, 5,069,971, Cl. 428-391.000.

Sawaragi, Yoshiatsu: *See*—
Iseda, Atsuro; and Sawaragi, Yoshiatsu, 5,069,870, Cl. 420-70.000.

Sawicki, Robert A.; and Harrison, Jeffrey B., to Texaco, Inc. Method for making a catalyst composition used in the production of lower aliphatic alcohols. 5,070,058, Cl. 502-206.000.

Scadlich, Gunter: *See*—
Burst, Hermann; Gosse, August-Wilhelm; Scadlich, Gunter; and Hotzer, Georg, 5,069,499, Cl. 296-201.000.

Scanlon, Patricia M.: *See*—
Hwa, Chih M.; Kelly, John A.; Neton, Janet; Scanlon, Patricia M.; and Gaudette, Roger R., 5,069,798, Cl. 210-700.000.

Schad, Robert D.; Akselrud, Vitaly; and DiSimone, John, to Husky Injection Molding Systems Ltd. Stack mold with insulated runner. 5,069,615, Cl. 425-556.000.

Schafer, Horst: *See*—
Hofer, Peter; Muller, Ulrich; Barenz, Manfred; Schafer, Horst; and Muller-Lierheim, Wolfgang, 5,069,542, Cl. 351-160.00H.

Schaffer, Allan B. Process for gluing to a horse's hoof. 5,069,289, Cl. 168-4.000.

Schalk, Petrus Wouter H., to Du Pont de Nemours, E. I., and Company. Connector for cable conductors. 5,069,638, Cl. 439-439.000.

Schallner, Otto: *See*—
Fischer, Reiner; Jensen-Korte, Uta; Kunisch, Franz; Marhold, Albrecht; Ooms, Pieter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,069,711, Cl. 71-92.000.

Schering Corporation: *See*—
Abrams, John S.; and Van Dyke, Robert E., 5,070,013, Cl. 435-7.500.
Friary, Richard, 5,070,086, Cl. 514-183.000.

Schiavi Cesare Costruzioni Meccaniche S.p.A.: *See*—
Schiavi, Vito, 5,069,125, Cl. 101-152.000.

Schiavi, Vito, to Schiavi Cesare Costruzioni Meccaniche S.p.A. Rotary gravure printing machine. 5,069,125, Cl. 101-152.000.

Schiehser, Guy A.; and Von Burg, Gregory F., to American Home Products Corporation. Phospholipase A2 inhibitors. 5,070,207, Cl. 548-208.000.

Schievelbusch, Ulrich, to Fichtel & Sachs AG. Driving hub for a vehicle. 5,069,655, Cl. 475-186.000.

Schirbl, Reinhard: *See*—
Meusel, Otto; Burger, Josef; Deinhardt, Gunther; and Schirbl, Reinhard, 5,070,430, Cl. 361-407.000.

Schlafer, John: *See*—
Rideout, William C.; Holmstrom, Roger P.; Eichen, Elliot; Powazinik, William; LaCourse, Joanne; Schlafer, John; and Lauer, Robert B., 5,069,561, Cl. 385-14.000.

Schlafer, Ludwig; and Russ, Werner H., to Hoechst Aktiengesellschaft. Water-soluble azo compounds containing a sulfo-naphthol as a coupling component and having fiber-reactive groups of the vinylsulfone series, suitable as dyestuffs. 5,070,189, Cl. 534-642.000.

Schlessel, Walter, to Gemco Ware, Inc. Multi-purpose poultry roaster and baking rack. 5,069,117, Cl. 99-419.000.

Schlich, William R.: *See*—
Giles, Harold F., Jr.; and Schlich, William R., 5,070,142, Cl. 525-66.000.

Schlosser, Erich J.; and Alden, J. Michael, to Weber-Stephen Products Co. Pivoting auxiliary rack. 5,069,196, Cl. 126-25.00R.

Schlossherr, Horst-Werner: *See*—
Kaufmann. Friedrich; Schlossherr, Horst-Werner; and Zinn, Egon, 5,069,122, Cl. 101-9.000.

Schmahl, Gunter: *See*—
Mehlhorn, Heinz; Schmahl, Gunter; Lindner, Werner; and Haberkorn, Axel, 5,070,091, Cl. 514-242.000.

Schmalbach Lubeca AG: *See*—
Hinterwaldner, Rudolf; and Bolte, Georg, 5,070,121, Cl. 524-31.000.

Schmatz, Duane J.; Badgley, John S.; and McHugh, Charles O., to Ford Motor Company. Cutting tool for aluminum workpieces having enhanced crater wear resistance. 5,069,092, Cl. 82-1.110.

Schmid, Alfred: *See*—
Reihl, Peter; Fuerst, Arpad; Wingen, Bernhard; Schmid, Alfred; Schreiter, Thomas; and Haendler, Erich, 5,069,500, Cl. 296-214.000.

Schmid, Karl; Meffert, Alfred; Friedrich, Klaus; Langen, Michael; and Herrmann, Klaus, to Henkel Kommanditgesellschaft auf Aktien. Process for making polyoxyethylene surfactants with desirable low temperature behavior. 5,069,817, Cl. 252-351.000.

Schmidt, Joachim: *See*—
Blanke, Inge; Burckhardt, Hans-Georg; Gora, Frieder; Guldner, Karlheinz; Dehoust, Jurgen; Modes, Christina; Kemmler-Sack, Sybille; and Schmidt, Joachim, 5,069,824, Cl. 252-518.000.

Schmidt, Robert R.: *See*—
Draber, Wilfried; Babczinsky, Peter; Santel, Hans-Joachim; Lurssen, Klaus; and Schmidt, Robert R., 5,069,712, Cl. 71-92.000.
Fischer, Reiner; Jensen-Korte, Uta; Kunisch, Franz; Marhold, Albrecht; Ooms, Pieter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,069,711, Cl. 71-92.000.

Schmidt, Thomas A.; Overland, David A.; Huffman, Paul F.; and Nelson, Paige R., to Onan Corporation. Automatic choke apparatus and method. 5,069,180, Cl. 123-376.000.

Schmitt, Franz: *See*—
Kiefer, Berthold; and Schmitt, Franz, 5,070,299, Cl. 324-309.000.

Schmitt, Thomas E.: *See*—
Kulesha, Richard L.; Jones, Michael D.; and Schmitt, Thomas E., 5,069,318, Cl. 188-377.000.

Schmitz, Gunter, to FEV Motorentechnik GmbH KG. Method for determining the alcohol content and/or the calorific value of fuels via propagation parameters. 5,069,070, Cl. 73-597.000.

Schneider, Bernard: *See*—
Godard, Jacques; and Schneider, Bernard, 5,069,368, Cl. 222-321.000.

Schneider, Josef, to Man Roland Druckmaschinen AG. Method of operating a printing machine during start-up or run-on and optically testing a printed image. 5,069,124, Cl. 101-142.000.

Schneider, Klaus. Apparatus for pressing multilayer packs. 5,069,120, Cl. 100-93.00P.

Schofield, Richard W.: *See*—
Radovich, John M.; and Schofield, Richard W., 5,069,788, Cl. 210-321.800.

Scholl, Hans-Joachim: *See*—
Welte, Rainer; and Scholl, Hans-Joachim, 5,070,115, Cl. 521-173.000.

Schonberg, David J., to Schonberg, David J. Coin operated shopping cart rental system. 5,069,325, Cl. 194-235.000.

Schophoff, Friedrich: *See*—
Binder, Rudolf; Schophoff, Friedrich; and Hofmann, Klaus, 5,069,682, Cl. 8-526.000.

Schopp, Richard: *See*—
Janczak, Christian; and Schopp, Richard, 5,070,266, Cl. 310-77.000.

Schorn, Norbert; Stock, Hugo; Bartels, Richard; and Fendel, Willi, to Kloeckner-Humboldt-Deutz AG. Exhaust gas line system for a supercharged internal combustion engine. 5,069,036, Cl. 60-323.000.

Schorsch, Gilbert: *See*—
Peccoux, Pierre-Michael; and Schorsch, Gilbert, 5,070,132, Cl. 524-492.000.

Schott Glaswerke: *See*—
Baucke, Friedrich G. K.; Braun, Jutta; and Metz, Bernd, 5,069,535, Cl. 359-273.000.

Schottdorf, Johannes: *See*—
Niedermeier, Rudolf; and Schottdorf, Johannes, 5,069,560, Cl. 384-486.000.

Schramm, Kathleen D.; and Karol, Frederick J., to Union Carbide Chemicals and Plastics Technology Corporation. Novel coimpregnated vanadium-zirconium catalyst for making polyethylene with broad or bimodal MW distribution. 5,070,055, Cl. 502-107.000.

Schreiter, Thomas: *See*—
Reihl, Peter; Fuerst, Arpad; Wingen, Bernhard; Schmid, Alfred; Schreiter, Thomas; and Haendler, Erich, 5,069,500, Cl. 296-214.000.

Schroeder, George O.: *See*—
Tse, Samuel W.; Schroeder, George O.; and Iwanami, Teruo, 5,069,955, Cl. 428-213.000.

Schuberth-Werk GmbH. & Co., KG: *See*—
Zahn, Christian, 5,068,922, Cl. 2-6.000.

Schuebel, Klaus: *See*—
Bendix, Horst; Hochmuth, Bernd; Johannes, Dieter; Lakenmacher, Bodo; Lausch, Winfried; and Schuebel, Klaus, 5,069,891, Cl. 423-359.000.

Schuerman, Cornelis P.; and Nauta, Gadze C., to Oce-Nederland B.V. Method of and means for processing image data. 5,070,531, Cl. 382-49.000.

Schuermann, Udo: *See*—
Burgholte, Alwin; Schuermann, Udo; Hieronimus, Warner; and Horneborg, Horst, 5,070,276, Cl. 315-209.00R.

Schuetz, Guenter; Stueber, Hans-Guenter; and Kinzig, Volker, to Leybold Aktiengesellschaft. Bearings for use in negative-pressure environments. 5,069,603, Cl. 417-423.400.

Schulte, Willy: *See*—
Krings, Reiner; and Schulte, Willy, 5,069,761, Cl. 205-183.000.

Schultz, Laurence D.: *See*—
Sandhu, Gurtej S.; Schultz, Laurence D.; and Doan, Trung T., 5,069,002, Cl. 51-165.00R.

Schulz, Harvey W.: *See*—
Martens, Kent L.; and Schulz, Harvey W., 5,069,451, Cl. 273-57.200.

Schulz, Horst: *See*—
Gerum, Johannes; Schulz, Horst; and Sauter, Jurgen, 5,069,931, Cl. 427-128.000.

Schundehutte, Karl H.; Groll, Manfred; and Stawitz, Josef W., to Bayer Aakatiengesellschaft. Reactive phthalocyanine dyestuffs. 5,070,193, Cl. 540-125.000.

Schupphaus, Dieter; and Nowak, Hans D., to Klockner-Becorit GmbH. Double central chain belt assembly. 5,069,328, Cl. 198-731.000.

Schuricht, Jurgen; and Zeiss, Armin, to Pitney Bowes Inc. Parcel processing system with end of day rating. 5,070,463, Cl. 364-464.020.

Schwab, Gerhart, to Mead Corporation, The. Method for separation of microcapsules and preparation of printing inks. 5,069,831, Cl. 264-4.330.

Schwalm, Reinhold; and Binder, Horst, to Keil & Weinkauf. Positive and negative working radiation sensitive mixtures and production of relief patterns. 5,069,997, Cl. 430-270.000.

Schwalm, Reinhold; Boettcher, Andreas; Fischer, Martin; and Binder, Horst, to BASF Aktiengesellschaft. Radiation sensitive mixture and production of relief patterns. 5,069,998, Cl. 430-270.000.

Schwartz, Ansel M.: *See*—
Einhorn, Robert K.; and Szoke, Istvan, 5,070,321, Cl. 340-608.000.

Schwarz, Wolfgang: *See*—
Buckley, Dieter; Munster, Erhard; and Schwarz, Wolfgang, 5,069,130, Cl. 102-202.000.

Schweitzer, Edmund O., Jr. Fault indicator having liquid crystal status display. 5,070,301, Cl. 324-509.000.

Scientific Design Company, Inc.: *See*—
Barone, Bruno J., 5,070,060, Cl. 502-209.000.

Scott, David B.; and Tran, Hiep V., to Texas Instruments Incorporated. High voltage lateral transistor. 5,070,381, Cl. 357-35.000.

Scouten, Douglas G. Fuel agitating device for internal combustion engine. 5,069,191, Cl. 123-538.000.

Scovill Fasteners Inc.: *See*—
Gruenenfelder, Terri P., 5,069,952, Cl. 428-193.000.

Scranton, Joseph D.: *See*—
McKee, L. Michael; Scranton, Joseph D.; Brookey, Robert L.; Gurley, Derrel; and Sodich, Ernie, 5,069,280, Cl. 166-278.000.

Screg Routes et. Travaux Publics: *See*—
Bense, Pierre; and Patte, Jean-Francois, 5,069,578, Cl. 404-75.000.

Scuka, Rodney W., to Ranco Incorporated of Delaware. Door ajar alarm for refrigeration unit. 5,070,319, Cl. 340-384.00E.

Scully, Keith J.; and Singh, Harinder S., to International Business Machines Corporation. Methods for handling calendar information in a data processing system. 5,070,470, Cl. 364-705.080.

Seadler, Paul J.: *See—*
Swiderski, Paul R.; and Seadler, Paul J., 5,069,309, Cl. 182-119.000.

Seals-It, Inc.: *See—*
Matczak, Joseph A.; and Matczak, Stanley E., 5,069,571, Cl. 403-134.000.

Sears, Wen-Hsiu: *See—*
Garneau, Denis; and Sears, Wen-Hsiu, 5,070,456, Cl. 364-419.000.

Seasholtz, Craig A., to Shop Vac Corporation. Dual-activator safety switch for liquid sprayer. 5,069,391, Cl. 239-332.000.

Security Tag Systems, Inc.: *See—*
Lynch, John L.; and Charlot, Lincoln H., Jr., 5,069,047, Cl. 70-57.100.

Seelye, David E.: *See—*
Bambury, Ronald E.; and Seelye, David E., 5,070,215, Cl. 556-418.000.

Segall, Jeanne; and Shorr, Leonard M. Stabilized antimicrobial compositions. 5,070,105, Cl. 514-626.000.

Seidel, Pessach, to Oran Heating Equipment Limited. Heat exchanger assembly and panel therefor. 5,069,276, Cl. 165-166.000.

Seike, Shoji; Mori, Koichi; Ikeda, Mitsuji; Nozaki, Masayuki; Okajima, Hisakazu; Katsukawa, Hiroyuki; Nakanishi, Kazumi; and Doi, Kenji, to NGK Insulators, Ltd. Optical fiber built-in type composite insulator and method of producing the same. 5,069,525, Cl. 385-100.000.

Seiko Epson Corporation: *See—*
—Mochizuki, Seiji; Naka, Takahiro; Hara, Kazuhiko; Takagi, Akira; and Hanaoka, Yukihiro, 5,070,346, Cl. 346-140.00R.
—Murata, Sadao; Harada, Yasuhiro; and Hama, Susumu, 5,069,123, Cl. 101-93.210.

Seiko Instruments Inc.: *See—*
—Imura, Yukihiro, 5,070,386, Cl. 357-52.000.

Seikosha Co., Ltd.: *See—*
—Ishikawa, Yasushi, 5,069,437, Cl. 271-3.100.
—Ito, Kanji; and Kakuta, Mitsuhiro, 5,070,354, Cl. 354-412.000.

Seiner, Jerome A.: *See—*
Nugent, Richard M., Jr.; Ward, Thomas A.; Greigger, Paul D.; and Seiner, Jerome A., 5,070,119, Cl. 523-179.000.

Seitz Enzinger Noll Maschinenbau Aktiengesellschaft: *See—*
Becker, Hans F.; and Rudolf, Dieter, 5,069,791, Cl. 210-344.000.

Seki, Akinori: *See—*
Konushi, Fumihiro; Nakatu, Hiroshi; Inoguchi, Kazuhiko; Okumura, Toshiyuki; Seki, Akinori; Takiguchi, Haruhisa; Nakanishi, Chitose; Sugahara, Satoshi; and Kudo, Hiroaki, 5,070,510, Cl. 372-46.000.

Seki, Masaki; Samukawa, Koji; and Hanaoka, Osamu, to Fanuc Ltd. NC data creation method. 5,070,464, Cl. 364-474.340.

Seki, Reiji: *See—*
Ishii, Noriyuki; Hirano, Masayasu; Kajita, Hideo; Kuroda, Hirokazu; Izumi, Shuji; Fujino, Akihiko; Ishimura, Toshihiko; and Seki, Reiji, 5,070,234, Cl. 235-441.000.

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Sekine, Shuji; Furuya, Takeo; and Obara, Tetsuya, to Jidosha Denki Kogyo K.K. Sunroof driving apparatus. 5,069,502, Cl. 296-223.000.

Seko, Kenji; Akaki, Yuu; Iwasawa, Naozumi; and Kondo, Toshio, to Kansai Paint Co., Ltd. Electrodeposition coating composition for use in printed circuit board photo resist. 5,070,000, Cl. 430-280.000.

Select Corporation: *See—*
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Selin, Lennart: *See—*
Johansson, Sven-Eric; Melhus, Ulf; and Selin, Lennart, 5,069,135, Cl. 102-380.000.

Sell, Charles R.; and Weiss, Mark A., to United States of America, Agriculture. Estimation of fumigant residues in commodities. 5,069,061, Cl. 73-19.010.

Sellers, Charles A., to Compaq Computer Corporation. Removable dual bin envelope feed tray for an image reproduction machine. 5,069,434, Cl. 271-2.000.

Selway, John W. T.; Beacham, Lowrie M., III; Daluge, Susan M.; Van Tuttle, Joel; and Krenitsky, Thomas A., to Burroughs Wellcome Co. Antiviral compounds. 5,070,078, Cl. 514-50.000.

Selzer, Robert J.: *See—*
Shust, Deborah J.; Selzer, Robert J.; and Adamisin, Dennis A., 5,069,538, Cl. 359-871.000.

Sember, Joseph A.: *See—*
Sember, Joseph A., III; and Sember, Joseph A., 5,069,837, Cl. 264-45.200.

Sember, Joseph A., III; and Sember, Joseph A. Method of forming inflatable upholstered cushion. 5,069,837, Cl. 264-45.200.

Semeraro, Claudio: *See—*
Casagrande, Cesare; Norcini, Gabriele; Santangelo, Francesco; and Semeraro, Claudio, 5,070,106, Cl. 514-651.000.

Semiconductor Energy Laboratory Co., Ltd.: *See—*
Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, 5,069,531, Cl. 359-55.000.
Yamazaki, Shuppei, 5,070,364, Cl. 355-211.000.

Semotiuk, Robert A. Hose fitting removal apparatus. 5,068,953, Cl. 29-235.000.

Seng, Gert; and Vesin, Gerard, to Wagner Foerdertechnik GmbH & Co. Kg. Controller for powered industrial trucks. 5,069,082, Cl. 74-523.000.

Seo, Keiji: *See—*
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Servus Rubber Company: *See—*
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Setoguchi, Hiromi: *See—*
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Seuter, Friedel: *See—*
Mohrs, Klaus; Perzborn, Elisabeth; Seuter, Friedel; Fruchtmann, Romanis; and Kohlsdorfer, Christian, 5,070,096, Cl. 514-311.000.

Sexton, Eugene D. Air comfort pillow. 5,068,933, Cl. 5-441.000.

Seyferth, Dietmar; Sobon, Christine A.; and Borm, Jutta, to Massachusetts Institute of Technology. Preceramic organosilicon-metal carbonyl polymers. 5,070,116, Cl. 523-22.000.

Seymour, Colin J.; Steel, Martin C.; and Trumble, Francis R., to Thorn EMI plc. Discharge tube arrangement. 5,070,278, Cl. 315-248.000.

Seymour, Raymond K.: *See—*
Magnon, Gary D.; Seymour, Raymond K.; Lesslie, David J.; Guerrette, Michael C.; and McKay, Geoffrey H., 5,070,361, Cl. 335-172.000.

SGS-Thomson Microelectronics, Inc.: *See—*
Liou, Fu-Tai; and Spinner, Charles R., 5,070,391, Cl. 357-71.000.

SGS-Thomson Microelectronics SA: *See—*
Nicolai, Jean, 5,070,311, Cl. 331-111.000.

Shacham, Yosef Y.: *See—*
Sinar, Alexander B.; Gerzberg, Levy; Shacham, Yosef Y.; Blech, Ilan A.; and Sirkin, Eric R., 5,070,383, Cl. 357-51.000.

Shafer, Sheldon J.: *See—*
Clagett, Donald C.; Fox, Daniel W.; Shafer, Sheldon J.; and Sybert, Paul D., 5,070,177, Cl. 528-196.000.

Shagott, David: *See—*
Travis, Terrell; Shagott, David; Kruse, Gary; Sutherland, Daniel; and Harber, Blair, Jr., 5,069,691, Cl. 55-126.000.

Shaikh, Aziz S.: *See—*
Gardner, Robert D.; Hopp, Dineen M.; Shaikh, Aziz S.; and Roberts, Gordon J., 5,070,047, Cl. 501-16.000.

Shalaby, Shalaby W.: *See—*
Njieha, Francois K.; and Shalaby, Shalaby W., 5,070,188, Cl. 530-324.000.

Shank, Walter A. Self-storing fishing rod holder. 5,068,996, Cl. 43-21.200.

Shanklin, James R., Jr.: *See—*
Teng, Lina C.; Walsh, David A.; and Shanklin, James R., Jr., 5,070,087, Cl. 514-212.000.

Sharma, Kuldeepak; Roy, Samir D.; and Roos, Eric J., to Cygnus Therapeutic Systems. Transdermal administration of buprenorphine. 5,069,909, Cl. 424-449.000.

Sharp Kabushiki Kaisha: *See—*
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Konushi, Fumihiro; Nakatu, Hiroshi; Inoguchi, Kazuhiko; Okumura, Toshiyuki; Seki, Akinori; Takiguchi, Haruhisa; Nakanishi, Chitose; Sugahara, Satoshi; and Kudo, Hiroaki, 5,070,510, Cl. 372-46.000.
Okano, Tokiyuki; Inamoto, Kiyoshi; Ohnishi, Kazuyuki; Nishiyama, Hidetomo; Sohda, Kazunori; Tokishige, Masato; and Shimazawa, Yoichi, 5,070,368, Cl. 355-246.000.
Tamagaki, Akira; and Iwai, Shougo, 5,070,360, Cl. 355-40.000.
Yamane, Daiji; Horie, Nobuyuki; Taguchi, Aisaku; and Sugiura, Teruki, 5,070,285, Cl. 318-461.000.
Yuki, Yoshio; and Hara, Takafumi, 5,070,347, Cl. 346-140.00R.

Shawcross, James P., to Emerson Electric Co. Ceiling fan with removable hub. 5,069,601, Cl. 417-360.000.

Shayegani, Mehdi: *See—*
Parsons, Linda M.; Bopp, Lawrence; Waring, Alfred L.; and Shayegani, Mehdi, 5,070,011, Cl. 435-6.000.

Shea, Reeford P. Fuel dispensing nozzle with vapor-proof seal. 5,069,260, Cl. 141-292.000.

Shekleton, Jack R.; Vershure, Roy W., Jr.; and Smith, Robert W., to Sundstrand Corporation. Gas turbine engine stored energy combustion system. 5,069,031, Cl. 60-39.120.

Shekleton, Jack R., to Sundstrand Corporation. Radial inflow combustor. 5,069,033, Cl. 60-39.360.

Shell Internationale Research Maatschappij, B.V.: *See—*
Carson, Ian G.; and Bentvelsen, Petrus A., 5,070,056, Cl. 502-110.000.
Guiton, Jeremy D. L., 5,069,737, Cl. 156-210.000.

Shell Oil Company: *See—*
Berni, Albert J., 5,070,483, Cl. 367-14.000.
Biswas, Jaydeep; Maxwell, Ian E.; and Van Der Eijk, Johan M., 5,069,776, Cl. 208-120.000.
Borchardt, John K.; and Lau, Hon Chung, 5,069,802, Cl. 252-8.554.
Brownscombe, Thomas F.; Forschner, Thomas C.; and Slaugh, Lynn H., 5,070,052, Cl. 502-60.000.
Rhodes, Robert B.; Eckert, Rudolf J.; and Loeffler, Donald E., 5,070,131, Cl. 524-484.000.
Wong, Pui K.; and Drent, Eit, 5,070,184, Cl. 528-491.000.

Shepherd Products U.S., Inc.: *See—*
Estkowski, Michael H.; Estkowski, Christopher G.; and Gaishin, Michael, 5,068,943, Cl. 16-18.00A.

Shepherd, William R.; and Huentelman, James H., to Boeing Company, The. Compartment partition and pressure relief door therefor. 5,069,401, Cl. 244-118.500.

Sheppard, Michael W., to Flexonics Inc. Flexible connector. 5,069,487, Cl. 285-226.000.

Sheppard, Sheron R.; and Polston, Henry B., to Ray Harvey Company, Inc. Apparatus for cleaning sewers. 5,068,940, Cl. 15-104.310.

Sherba, Samuel E.; and Mehta, Rai J., to Rohm and Haas Company. Antialgal compositions comprising diphenylethers and lysozyme, methods of controlling algae, and coating compositions comprising the antialgal compositions. 5,069,717, Cl. 106-18.350.

Sherman, James F., to General Motors Corporation. Multispeed power transmission. 5,069,656, Cl. 475-276.000.

Sherman, Laura. Panty hose storage device. 5,069,514, Cl. 312-348.300.

Sherwood, David E., Jr.: *See—*
Dai, Pei-Shing E.; Sherwood, David E., Jr.; and Martin, Bobby R., 5,069,890, Cl. 423-328.000.

Shiba, Masataka: *See—*
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Shiba, Nobuyasu: *See—*
Imai, Mizuho; Sekiguchi, Mikio; Shiba, Nobuyasu; and Iida, Hideyo, 5,069,157, Cl. 118-314.000.

Shibata, Jiro: *See—*
Sakigawa, Shigenori; Ohashi, Ryota; Shibata, Jiro; and Kawamura, Masahisa, 5,069,037, Cl. 60-435.000.

Shibata, Norio: *See—*
Chino, Naoyoshi; Shibata, Norio; and Chikamasa, Hiroshi, 5,069,934, Cl. 427-131.000.

Shibukawa, Takeo, to Yamaha Corporation. Automatic key-depression indication apparatus. 5,069,104, Cl. 84-478.000.

Shida, Mitsu: *See—*
Pucci, Mark S.; Shida, Mitsu; Machonis, John, Jr.; and Jachec, Kevin, 5,070,143, Cl. 525-74.000.

Shidara, Keiichi: *See—*
Kikawa, Takeshi; Tsuji, Kazutaka; Sameshima, Kenji; Hirai, Tadaaki; Yamazaki, Junichi; Kubota, Misao; and Shidara, Keiichi, 5,070,272, Cl. 313-386.000.

Shieh, Yi C. Lock mechanism for a cycling vehicle. 5,069,049, Cl. 70-227.000.

Shiga, Nobuo, to Sumitomo Electric Industries, Ltd. Semiconductor device. 5,070,376, Cl. 357-22.000.

Shikakura, Akihiro, to Canon Kabushiki Kaisha. Digital information transmitting and receiving system. 5,070,503, Cl. 371-37.100.

Shimada, Hiroo: *See—*
Inoue, Kazuo; Sano, Shoichi; Ogura, Misami; Nagahiro, Kenichi; Konno, Tsuneo; Kajiwara, Hajime; Ono, Yoshinobu; Yoshida, Suguru; Shimada, Hiroo; and Hashiguchi, Masahiro, 5,069,306, Cl. 180-291.000.

Shimada, Makoto: *See—*
Togai, Kazuhide; Danno, Yoshiaki; Yoshida, Masato; Shimada, Makoto; and Ueda, Katsunori, 5,069,181, Cl. 123-399.000.

Shimano Industrial Co., Ltd.: *See—*
Noda, Hideo, 5,069,396, Cl. 242-321.000.

Shimazaki, Kenshiro. Artificial bait and material therefor. 5,068,997, Cl. 43-42.250.

Shimazawa, Yoichi: *See—*
Okano, Tokiyuki; Inamoto, Kiyoshi; Ohnishi, Kazuyuki; Nishiyama, Hidetomo; Sohda, Kazunori; Tokishige, Masato; and Shimazawa, Yoichi, 5,070,368, Cl. 355-246.000.

Shimirak, Gerald L.; Chan, Paul S.; Kay, John; Croce, Jim; Huynh, Van L.; Swinmurn, John; and Bierlein, Eric, to Raychem Corporation. Terminal block and adapter. 5,069,636, Cl. 439-412.000.

Shimizu, Atsushi: *See—*
Yokota, Masahisa; Shimizu, Atsushi; Komiya, Kyosuke; Yamataka, Kazunori; and Nomura, Tadanori, 5,070,173, Cl. 528-85.000.

Shimizu, Hiroshi, to NEC Corporation. Token passing type slotted loop network system with means for enabling high speed access control and simple frame slot stripping. 5,070,501, Cl. 370-85.400.

Shimizu, Mitsuharu, to Shinko Electric Industries Co., Ltd. Semiconductor device using a tape carrier. 5,070,390, Cl. 357-70.000.

Shimizu, Seiji: *See—*
Kuzuya, Susumu; Shimizu, Seiji; Kato, Mikio; Ishikawa, Yujiro; Sakai, Takashi; and Yuki, Eiji, 5,069,557, Cl. 400-120.000.

Shimizu, Tetsuya: *See—*
Ishii, Yoshiki; Shimokoriyama, Makoto; Shimizu, Tetsuya; Yoshimura, Katsuji; Fujii, Akio; and Sasatani, Tomohiko, 5,070,402, Cl. 358-135.000.

Shimokoriyama, Makoto: *See—*
Ishii, Yoshiki; Shimokoriyama, Makoto; Shimizu, Tetsuya; Yoshimura, Katsuji; Fujii, Akio; and Sasatani, Tomohiko, 5,070,402, Cl. 358-135.000.

Shimomura, Yoshimasa: *See—*
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Shimozawa, Toru: *See—*
Yokoyama, Kenji; Nakayama, Masatoshi; Shimozawa, Toru; Ueda, Kunihiro; and Maruta, Fumio, 5,069,967, Cl. 428-336.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Shiobara, Toshio; and Simizu, Hisashi, 5,070,154, Cl. 525-422.000.
Tsumura, Hiroshi; Mutoh, Kiyoyuki; Satoh, Kazushi; and Isobe, Ken-ichi, 5,070,175, Cl. 528-12.000.

Shin, Yasuhiro, to Oki Electric Industry Co., Ltd. Multi-level selecting circuit. 5,070,255, Cl. 307-268.000.

Shinkai, Masanao: *See—*
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Shinko Electric Industries Co., Ltd.: *See—*
Shimizu, Mitsuharu, 5,070,390, Cl. 357-70.000.

Shinohara, Junichi: *See—*
Nakamura, Yoshio; Shinohara, Junichi; and Kishida, Daisuke, 5,070,356, Cl. 354-439.000.

Shinohara, Tohru; and Tsurumi, Hiroshi, to Fujitsu Limited. Magnetic disk drive. 5,070,420, Cl. 360-75.000.

Shinozaki, Haruhiko: *See—*
Masaki, Mitsuo; Satoh, Masaru; Moritoh, Naoya; Hashimoto, Koichi; Kamishiro, Toshiro; and Shinozaki, Haruhiko, 5,070,196, Cl. 540-450.000.

Shinto, Hiroaki: *See—*
Koide, Teruhiko; Buma, Kozi; Ogasawara, Takashi; and Shinto, Hiroaki, 5,069,479, Cl. 280-734.000.

Shiobara, Toshio; and Simizu, Hisashi, to Shin-Etsu Chemical Co., Ltd. Composition of maleimide and aromatic-double bond epoxy resin. 5,070,154, Cl. 525-422.000.

Shiraki, Kouji, to Toyoda Gosei Co., Ltd. Pad for air bag device. 5,069,477, Cl. 280-732.000.

Shirashoji, Hisashi: *See—*
Nakasaki, Eiji; Shirashoji, Hisashi; Hoshikawa, Katsuyuki; Kamijo, Takao; Ikeda, Kazushige; Inoue, Yasuhiro; and Kato, Takeo, 5,069,262, Cl. 152-536.000.

Shiratori Co., Ltd.: *See—*
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Shiratori, Koji, to Shiratori Co., Ltd. Water slider lane. 5,069,443, Cl. 272-56.50R.

Shirey, Ray A.; and Murray, David E., to Westinghouse Electric Corp. Nuclear steam generator sludge lance method and apparatus. 5,069,172, Cl. 122-382.000.

Shirmer, Ulrich: *See—*
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Shiroi, Takashi: *See—*
Sasaoka, Michio; Saito, Nori; Shiroi, Takashi; Nagao, Shigemitsu; Kikuchi, Ryo; and Kameyama, Yutaka, 5,070,194, Cl. 540-214.000.

Shirosaki, Takehiro; Kikkawa, Takashi; and Toshima, Hirotaka, to Oiles Corporation. Method for reducing high-load, low-speed wear resistance in sliding members. 5,069,874, Cl. 420-478.000.

Shirota, Masako: *See—*
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Watababe, Naotaka; Arai, Takao; Fujiyoshi, Hitoshi; and Shirota, Masako, 5,069,754, Cl. 162-168.200.

Shop Vac Corporation: *See—*
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Shorr, Leonard M.: *See—*
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Short, David E.; Ahlstone, Arthur G.; and Valka, William A., to FMC Corporation. Retrievable guide base for subsea well. 5,069,287, Cl. 166-339.000.

Showa Aluminum Kabushiki Kaisha: *See—*
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Ohneda, Noboru; Ushioda, Shunta; Arima, Haruo; Hashimoto, Ichiro; Kaneko, Denziro; Sugiyama, Kazuo; Fukazawa, Tsuguo; Tachi, Teruo; and Mukasa, Takashi, 5,069,095, Cl. 82-124.000.
Suzuki, Katsuhisa; and Tokutake, Toshinori, 5,069,275, Cl. 165-67.000.

Shust, Deborah J.; Selzer, Robert J.; and Adamisin, Dennis A., to Navistar International Transportation Corp. Aerodynamic deflector for a rear view mirror with an integral side marker light. 5,069,538, Cl. 359-871.000.

Shutske, Gregory M., to Hoechst Roussel Pharmaceuticals Inc. 12-halogenated forskolin derivatives. 5,070,209, Cl. 549-228.000.

Shutt, Eric, to Johnson Matthey Public Limited Company. Catalyst. 5,070,063, Cl. 502-230.000.

Shwab, Jacqueline A., to Cordis Corporation. Catheter with double step-down bore. 5,069,673, Cl. 604-280.000.

Shyu, Wen-Bin. Stomach exercise device. 5,069,448, Cl. 272-130.000.

Sicka, Richard W.: *See—*
Tompkins, Dale A.; and Sicka, Richard W., 5,069,850, Cl. 264-167.000.

Sidman, Alan L., to Digital Equipment Corporation. Method of manufacturing a thin film head. 5,068,959, Cl. 29-603.000.

Sieber, Alexander: *See—*
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Sieber, Isa: *See—*
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Siebert, Robert M. Lighted gun sight. 5,068,969, Cl. 33-241.000.

Siegfried Peyer AG: *See—*
Beeler, Alfred, 5,068,947, Cl. 19-106.00A.

Siegler, Thomas W.: *See—*
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Siemens Aktiengesellschaft: *See—*
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Finzel, Lothar; Kreuz, Monika; and Bachel, Ernst, 5,069,523, Cl. 385-135.000.
Kappeler, Franz; and Wolf, Thomas, 5,070,511, Cl. 372-50.000.
Kiefer, Berthold; and Schmitt, Franz, 5,070,299, Cl. 324-309.000.

Meusel, Otto; Burger, Josef; Deinhardt, Gunther; and Schirbl, Reinhard, 5,070,430, Cl. 361-407.000.
Oestreich, Ulrich, 5,069,526, Cl. 385-101.000.
Rudolph, Dietrich; and Steinemer, Norbert, 5,069,077, Cl. 74-102.000.
Tews, Helmut; and Zwicknagl, Hans-Peter, 5,070,028, Cl. 437-22.000.

Siemens Automotive Limited: *See—*
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Siemens Plessey Electronic Systems Limited: *See—*
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Siemers, Paul A.; and Rutkowski, Stephen F., to General Electric Company. Method for plasma spray joining active metal substrates. 5,070,228, Cl. 219-121.460.

Siljenberg, David W.: *See—*
Block, Timothy R.; Ebler, Marcia B.; Freitag, Ladd W.; Heiling, Gerald M.; Holter, Spencer C.; Karst, Dennis L.; Siljenberg, David W.; Soderstrom, Ronald L.; and Trnka, John T., 5,069,522, Cl. 385-39.000.

Sillery, Ruth C., to United States of America, Army. Isolated press fit muzzle reference sight mount. 5,068,968, Cl. 33-233.000.

Siltech Inc.: *See—*
O'Lenick, Anthony J., Jr., 5,070,168, Cl. 528-10.000.
O'Lenick, Anthony J., Jr., 5,070,171, Cl. 528-33.000.

Silverman, David C.; Lefelar, Judith A.; and Kinlen, Patrick J., to Monsanto Company. Metals coated with protective coatings of annealed perfluorinated cation-exchange polymers and method for making same. 5,069,974, Cl. 428-422.000.

Simco Industries, Inc.: *See—*
Simon, Louis, 5,068,971, Cl. 33-503.000.

Simes Societa Italiana Medicinali e Sintetici S.p.A.: *See—*
Casagrande, Cesare; Norcini, Gabriele; Santangelo, Francesco; and Semeraro, Claudio, 5,070,106, Cl. 514-651.000.

Simizu, Hisashi: *See—*
Shiobara, Toshio; and Simizu, Hisashi, 5,070,154, Cl. 525-422.000.

Simko, Aladar O., to Ford Motor Company. Charge intake system for a multi-intake valve per cylinder engine. 5,069,175, Cl. 123-193.00H.

Simon, Joseph A. Elongated, lightweight rack. 5,069,080, Cl. 74-422.000.

Simon, Louis, to Simco Industries, Inc. Adjustable portable coordinate measuring machine. 5,068,971, Cl. 33-503.000.

Simon, Robert H. M.: *See—*
Kavanagh, Dean L.; and Simon, Robert H. M., 5,069,734, Cl. 156-84.000.

Simpson, Stephen W., to University of Sydney, The. Gas detection by infrared absorption. 5,070,244, Cl. 250-343.000.

Sin, Chung H.: *See—*
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Sinar, Alexander B.; Gerzberg, Levy; Shacham, Yosef Y.; Blech, Ilan A.; and Sirkin, Eric R., to Zoran Corporation. Programmable memory matrix employing voltage-variable resistors. 5,070,383, Cl. 357-51.000.

Singeetham, Shiva P., to FMC Corporation. Single trip casing hanger/packoff running tool. 5,069,288, Cl. 166-348.000.

Singer Imaging, Inc.: *See—*
Singer, Jerome R.; Grunbaum, Francisco A.; Kohn, Philip D.; Zubelli, Jorge P.; Couch, John L.; Naparst, Harold L.; and Latham, Geoffrey, 5,070,455, Cl. 364-413.190.

Singer, Jerome R.; Grunbaum, Francisco A.; Kohn, Philip D.; Zubelli, Jorge P.; Couch, John L.; Naparst, Harold L.; and Latham, Geoffrey, to Singer Imaging, Inc. Imaging system and method using scattered and diffused radiation. 5,070,455, Cl. 364-413.190.

Singh, Harinder S.: *See—*
Scully, Keith J.; and Singh, Harinder S., 5,070,470, Cl. 364-705.080.

Sirkin, Eric R.: *See—*
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Sirven, Jacques: *See—*
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Sisas Societa Italiana Serie Acetica e Sintetica SpA: *See—*
Bertola, Aldo; and Ruggieri, Roberto, 5,069,687, Cl. 55-44.000.

Sisken, Richard B.: *See—*
Fearnot, Neal E.; and Sisken, Richard B., 5,069,674, Cl. 604-282.000.

Sit, Sing-Yuen; and Wright, John J., to Bristol-Myers Company. Tetrazol-1-yl containing intermediates. 5,070,206, Cl. 548-112.000.

Sjoqvist, Ingvar, to Milmas AB. Noise attenuator attachment arm. 5,068,923, Cl. 2-209.000.

Skatrud, Paul L.: *See—*
Ingolia, Thomas D.; Kovacevic, Steven; Miller, James R.; and Skatrud, Paul L., 5,070,020, Cl. 435-183.000.

Skirpan, Stephen J., to Union Connector Co., Inc. Portable power distribution cabinet and power distribution network with removable intermediate electrical connector. 5,070,429, Cl. 361-358.000.

Slaugh, Lynn H.: *See—*
Brownscombe, Thomas F.; Forschner, Thomas C.; and Slaugh, Lynn H., 5,070,052, Cl. 502-60.000.

Slidex Corporation: *See—*
Ozeki, Jiro, 5,069,648, Cl. 446-160.000.

Smedvig IPR A/S: *See—*
Freyer, Jan; and Nergaard, Arnfinn, 5,069,488, Cl. 285-302.000.

Smeets, Frans L. M.: *See—*
Humphreys, Robert W. R.; Harirchian, Bijan; and Smeets, Frans L. M., 5,069,812, Cl. 252-186.440.

Smetham, James N.: *See—*
Kennedy, David; Mussett, Gerard; Van Maanan, Alfons; and Smetham, James N., 5,069,131, Cl. 102-275.600.

Smith, David K.; and Wass, Anthony C. L., to Riker Laboratories, Inc. Inhaler. 5,069,204, Cl. 128-200.230.

Smith, Douglas J.; and Thompson, Paul D. Loader and carrier apparatus for boat and trailer. 5,069,595, Cl. 414-462.000.

Smith, Edmund S.; and Davies, John, to Densa Limited. Displacement sensor and medical apparatus. 5,069,221, Cl. 128-721.000.

Smith, Gene A. Apparatus for lifting and turning a patient confined to a bed. 5,068,931, Cl. 5-84.000.

Smith, Larry G.: *See—*
Bridges, Jack E.; Bajzek, Thomas J.; Hofer, Kenneth E.; Spencer, Homer L.; Smith, Larry G.; and Young, Vincent R., 5,070,533, Cl. 392-301.000.

Smith, Paul R.; Wolfgram, Orval F.; and Kobelia, Rudolph G., to General Motors Corporation. Parts feeder. 5,069,329, Cl. 198-752.000.

Smith, Robert W.: *See—*
Cole, Donald; and Smith, Robert W., 5,069,954, Cl. 428-202.000.
Shekleton, Jack R.; Vershure, Roy W., Jr.; and Smith, Robert W., 5,069,031, Cl. 60-39.120.

Smith, Scott A., to S2 Yachts Incorporated. Boat engine mounting. 5,069,414, Cl. 248-638.000.

Snyderman, Fredric; and Russell, Robert H., to CSA, Inc. Adjustable weight-lifting bench. 5,069,447, Cl. 272-123.000.

Sobon, Christine A.: *See—*
Seyferth, Dietmar; Sobon, Christine A.; and Borm, Jutta, 5,070,116, Cl. 523-22.000.

Societa Italiana Vetro - SIV - S.p.A.: *See—*
Leone, Massimo; and Paudice, Ciro, 5,069,852, Cl. 264-171.000.

Societe anonyme dite Hispano-Suiza: *See—*
Marescot, Jean-Marc D. L.; and Soulier, Pascal-Marie P. M., 5,068,946, Cl. 16-333.000.

Societe Chimique des Charbonnages S.A.: *See—*
Guerdoux, Lionel, 5,070,145, Cl. 525-179.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.": *See—*
Jourdain, Gerard E. A.; and Loubet, Marc G., 5,069,034, Cl. 60-261.000.

Societe Nouvelle de Bouchons Plastiques: *See—*
Salmon, Pierre; and Pradinas, Claude, 5,069,367, Cl. 222-153.000.

Sodec, Franc; and Veldboer, Werner, to H. Krantz GmbH & Co. Device for introducing a low turbulence displacement air flow into an enclosed space. 5,069,114, Cl. 454-297.000.

Soderstrom, Ronald L.: *See—*
Block, Timothy R.; Ebler, Marcia B.; Freitag, Ladd W.; Heiling, Gerald M.; Holter, Spencer C.; Karst, Dennis L.; Siljenberg, David W.; Soderstrom, Ronald L.; and Trnka, John T., 5,069,522, Cl. 385-39.000.

Sodich, Ernie: *See—*
McKee, L. Michael; Scranton, Joseph D.; Brookey, Robert L.; Gurley, Derrel; and Sodich, Ernie, 5,069,280, Cl. 166-278.000.

Sohda, Kazunori: *See—*
Okano, Tokiyuki; Inamoto, Kiyoshi; Ohnishi, Kazuyuki; Nishiyama, Hidetomo; Sohda, Kazunori; Tokishige, Masato; and Shimazawa, Yoichi, 5,070,368, Cl. 355-246.000.

Sojka, Marvin L.: *See—*
Mahany, Ronald L.; Sojka, Marvin L.; and West, Guy J., 5,070,536, Cl. 455-67.000.

Solar Turbines Incorporated: *See—*
Misiak, Richard J.; and Miller, Kenneth J., 5,069,382, Cl. 228-146.000.

Solon, Martin: *See—*
Haslett, Robert A.; Kosson, Robert L.; and Solon, Martin, 5,069,274, Cl. 165-32.000.

Solvay & Cie (Societe Anonyme): *See—*
Filippone, Mauro; and Lessi, Carlo, 5,069,884, Cl. 423-181.000.

Sommer, Andreas: *See—*
Dietz, Erwin; Sommer, Andreas; Kroh, Adolf; Hohn, Jurgen; Hafner, Otmar; and Rieper, Wolfgang, 5,070,159, Cl. 525-504.000.

Sonoco Products Company: *See—*
Matuszak, John J., 5,069,355, Cl. 220-270.000.

Sony Corporation: *See—*
Eguchi, Takeo, 5,070,416, Cl. 360-66.000.
Iwahashi, Naoto; Akagiri, Kenzo; and Setoguchi, Hiromi, 5,070,515, Cl. 375-27.000.
Kato, Tetsuro; and Nakamura, Yoshiyuki, 5,070,465, Cl. 395-141.000.
Kikuchi, Akihiro; and Fukuda, Tokuya, 5,070,408, Cl. 358-227.000.
Miyaji, Fumio, 5,070,482, Cl. 365-230.060.
Ogawa, Hiroshi; and Horimai, Hideyoshi, 5,070,496, Cl. 369-116.000.
Wilkinson, James H., 5,070,403, Cl. 358-136.000.

Sorby, Tore: *See—*
Bunce, Kevin R.; and Sorby, Tore, 5,069,239, Cl. 137-15.000.

Soriano, Zenaida B.: *See—*
Joshi, David P.; Ramachandran, P.; and Soriano, Zenaida B., 5,069,825, Cl. 252-533.000.

Sorkin, Reuben. Condom with proximal pubic shield. 5,069,228, Cl. 128-844.000.

Soulard, Paul; Chassaing, Paul; and Moreau, Georges, to Laboratoire Central des Ponts et Chaussees. Manipulator for public works machines and machine equipped with such manipulator for road works. 5,070,286, Cl. 318-568.100.

Soulier, Pascal-Marie P. M.: *See*—
Marescot, Jean-Marc D. L.; and Soulier, Pascal-Marie P. M., 5,068,946, Cl. 16-333.000.

Southland Corporation, The: *See*—
Baccus, John B., Jr., 5,069,924, Cl. 426-590.000.

SpaceLabs, Inc.: *See*—
Knoblich, Stanley M., 5,069,219, Cl. 128-679.000.

Sparton Corporation: *See*—
Bush, Carroll H., 5,070,427, Cl. 361-104.000.

Spater, Stuart S.: *See*—
Kolton, Chester; and Spater, Stuart S., 5,069,373, Cl. 223-85.000.

Spectra-Physics, Inc.: *See*—
Kaiser, Jeffrey L.; Wright, David L.; Hegedus, Denes A.; and Peterson, Alan B., 5,070,512, Cl. 372-65.000.

Speer, Harald: *See*—
Zillgitt, Ulrich; Speer, Harald; Haug, Kurt; Ebinger, Georg; Millers, Miervaldis; and Hasselmann, Heinrich, 5,070,433, Cl. 362-66.000.

Spencer, Homer L.: *See*—
Bridges, Jack E.; Bajzek, Thomas J.; Hofer, Kenneth E.; Spencer, Homer L.; Smith, Larry G.; and Young, Vincent R., 5,070,533, Cl. 392-301.000.

Spencer, Robert A. Bicycle transmission cleaning apparatus. 5,069,470, Cl. 280-288.400.

Sperzel, Michael: *See*—
Lockhoff, Oswald; Goossens, John; Brunner, Helmut; Sperzel, Michael; and Stunkel, Klaus G., 5,070,190, Cl. 536-22.000.

Spinner, Charles R.: *See*—
Liou, Fu-Tai; and Spinner, Charles R., 5,070,391, Cl. 357-71.000.

Spinney, Barry A.: *See*—
Hawe, William R.; Tardo, Joseph J.; Kaufman, Charles W.; Gupta, Amar; Spinney, Barry A.; and Waters, Gregory M., 5,070,528, Cl. 380-48.000.

Spiratos, Nelu: *See*—
Haase, Dieter; Spiratos, Nelu; and Jolicoeur, Carmel, 5,069,893, Cl. 423-556.000.

Spire Corporation: *See*—
Greenwald, Anton C.; and Buchanan, Bobby L., 5,070,026, Cl. 437-3.000.

Sprague, Barry N.: *See*—
Epperly, William R.; and Sprague, Barry N., 5,069,720, Cl. 106-287.350.

Sprunt, Eve S.; and Collins, Samuel H., to Mobil Oil Corporation. Method for measuring wettability of porous rock. 5,069,065, Cl. 73-153.000.

Squier, Steven: *See*—
Grennan, Robert; Rice, John; and Squier, Steven, 5,069,692, Cl. 55-158.000.

Staar Development Company S.A.: *See*—
Staar, Marcel J. H., 5,069,232, Cl. 132-320.000.

Staar, Marcel J. H., to Staar Development Company S.A. Disposable make-up systems. 5,069,232, Cl. 132-320.000.

Stahlecker, Fritz; and Stahlecker, Gerd, to Stahlecker, Fritz; and Stahlecker, Hans. Tangential belt drive for spinning or twisting machines. 5,069,027, Cl. 57-264.000.

Stahlecker, Gerd: *See*—
Stahlecker, Fritz; and Stahlecker, Gerd, 5,069,027, Cl. 57-264.000.

Stahlecker, Hans: *See*—
Stahlecker, Fritz; and Stahlecker, Gerd, 5,069,027, Cl. 57-264.000.

Stahlhofen, Paul, to Hoechst Aktiengesellschaft. Light-sensitive mixture for producing positive or negative relief copies. 5,070,001, Cl. 430-281.000.

Stalc, Anton: *See*—
Kovacic, Mateja; Milovac, Jenny; Cvelbar, Polona; Stalc, Anton; Trost, Zvezdana; Kopitar, Zdravko; Kofler, Bojan; Nikolic, Vida; Lampret, Marija; and Lippai, Marija, 5,069,910, Cl. 424-464.000.

Stanko, Wayne S., to BASF Corporation. High shrinkage polyester fibers and method of preparation. 5,070,185, Cl. 528-502.000.

Stanley Electric Co., Ltd.: *See*—
Wasimoto, Takasi; and Kimura, Morio, 5,069,640, Cl. 439-619.000.

Staodyn, Inc.: *See*—
Bartelt, James T.; Harris, Frank W.; and Owens, Alan R., 5,069,211, Cl. 128-421.000.

Starke Frank: *See*—
Amthor, Thomas; Neumann, Erwin; von Rolbicki, Wolfgang; and Starke Frank, 5,069,505, Cl. 297-216.000.

State of Israel, Atomic Energy Commission Roreq Nuclear Research Ctr., The: *See*—
Bornstein, Aharon; Wolfman, Dan; and Katz, Mordechai, 5,070,243, Cl. 250-341.000.

Statten, Michael I.: *See*—
Lehmann, Roger W.; and Statten, Michael I., 5,069,650, Cl. 446-476.000.

Stawitz, Josef W.: *See*—
Schundehutte, Karl H.; Groll, Manfred; and Stawitz, Josef W., 5,070,193, Cl. 540-125.000.

Stedman, Donald H.: *See*—
Durham, Michael D.; Stedman, Donald H.; Ebner, Timothy G.; and Burkhardt, Mark R., 5,070,246, Cl. 250-373.000.

Steel, Martin C.: *See*—
Seymour, Colin J.; Steel, Martin C.; and Trumble, Francis R., 5,070,278, Cl. 315-248.000.

Steele, John: *See*—
Cooper, Melvin; Fray, Michael J.; Richardson, Kenneth; and Steele, John, 5,070,205, Cl. 548-333.000.

Stefko, David J.: *See*—
Meuschke, Robert E.; Harper, Mark J.; and Stefko, David J., 5,069,863, Cl. 376-270.000.

Stein, Jay A.; Plewes, Donald B.; Gershman, Russell J.; Liebau, James G.; and Williams, John N., to Hologic, Inc. Selective equalization radiography. 5,070,519, Cl. 378-146.000.

Stein, Philip D.: *See*—
Hall, Steven E.; and Stein, Philip D., 5,070,099, Cl. 514-381.000.

Steinemer, Norbert: *See*—
Rudolph, Dietrich; and Steinemer, Norbert, 5,069,077, Cl. 74-102.000.

Steingraber, Gary C.: *See*—
Thompson, Paul D.; and Steingraber, Gary C., 5,069,162, Cl. 119-14.470.

Steinwender, Reinhold, to Radex-Heraklith Industriebeteiligungs Aktiengesellschaft. Keystone set. 5,069,015, Cl. 52-575.000.

Stendel, Wilhelm: *See*—
Fuchs, Rainer; Wachendorff-Neumann, Ulrike; Becker, Benedikt; Erdelen, Christoph; and Stendel, Wilhelm, 5,070,098, Cl. 514-359.000.

Stephens, Fred O., to Genicom Corporation. Acoustically dampened striker bar for impact printers and methods of assembly. 5,069,566, Cl. 400-656.000.

Sterilization Technical Services, Inc.: *See*—
Whitbourne, Richard J.; and Mangan, Margaret A., 5,069,899, Cl. 424-56.000.

Sterling, Arthur M.: *See*—
Zinner, Norman R.; and Sterling, Arthur M., 5,069,201, Cl. 128-79.000.

Sterling Marking Products Inc.: *See*—
Fink, Cameron L.; and Gentile, Anthony J., 5,069,567, Cl. 402-3.000.

Stern, Donald J.; Heaton, Jeff S.; Tryon, James A.; and Bartholmey, Brett A., to DJ S & T Limited Partnership. Manually adjustable spray applicator. 5,069,390, Cl. 239-320.000.

Stevens, E. Henry, to Quality Microcircuits Corporation. Process for contacting and interconnecting semiconductor devices within an integrated circuit. 5,070,036, Cl. 437-190.000.

Stevens, Eric G.: *See*—
Erhardt, Herbert J.; Nelson, Edward T.; and Stevens, Eric G., 5,070,380, Cl. 357-24.000.

Stevens, Michael D.: *See*—
Latif, Farrukh A.; and Stevens, Michael D., 5,070,477, Cl. 395-325.000.

Stevens, William D.: *See*—
Hansen, Arthur M.; Stevens, William D.; and Winkin, Justin P., 5,069,171, Cl. 122-4.00D.

Stiegler Maschinenfabrik GmbH: *See*—
Bochtler, Franz; and Ley, Wilhelm, 5,069,659, Cl. 493-194.000.

Stillwagon, Jacob M.: *See*—
Germer, Warren R.; Coryea, Peter F.; and Stillwagon, Jacob M., 5,068,962, Cl. 29-830.000.

Stinson, Douglas G.: *See*—
Hatwar, Tukaram K.; Palumbo, Anthony C., Jr.; and Stinson, Douglas G., 5,069,984, Cl. 428-694.000.

Stirling Technology, Inc.: *See*—
Chagnot, Bruce J., 5,069,272, Cl. 165-8.000.

Stitt, Paul A. Therapeutic and nutritive flax seed composition and methods employing the same. 5,069,903, Cl. 424-195.100.

Stobbs, Thomas J.; and Patel, Kishor J., to Applied Power Inc. Proportional pressure control valve. 5,069,420, Cl. 251-30.020.

Stock, Hugo: *See*—
Schorn, Norbert; Stock, Hugo; Bartels, Richard; and Fendel, Willi, 5,069,036, Cl. 60-323.000.

Stockinger, Friedrich; and Kramer, Andreas, to Ciba-Geigy Corporation. Bismides of allyl- or methallylbicyclo(2.2.1)hept-5-ene-2,3-dicarboxylic acid. 5,070,163, Cl. 526-259.000.

Stoddart, James O.: *See*—
Modrowski, Thomas A.; Pfister, Larry E.; Raybuck, Gregory A.; and Stoddart, James O., 5,069,762, Cl. 205-137.000.

Stoffel, Gerd. Process for producing a two-chamber pressurized package. 5,069,590, Cl. 413-1.000.

Stohr, Albert; and Rehle, Alfred, to Gebr. Hennig GmbH. Shavings conveyor. 5,069,327, Cl. 198-725.000.

Stokbroekx, Raymond A.; and Van der Aa, Marcel J. M., to Janssen Pharmaceutica N.V. Antipicorpaviral herterocyclic-substituted morpholinyl alkylphenol ethers. 5,070,090, Cl. 514-236.500.

Stoll, Kurt; and Halama, Herbert. Pneumatic shock absorber. 5,069,317, Cl. 188-286.000.

Stone, Michael, to Gourock Pacific, Inc. Footrope construction for a bottom trawl. 5,068,994, Cl. 43-9.900.

Storz, Martin, to Mannesmann Aktiengesellschaft. Transport device for paper sheets of varying or different widths and thickness. 5,069,442, Cl. 271-250.000.

Stouffer Industries Inc.: *See*—
Stouffer, John D.; and Deak, Ellen Y., 5,070,358, Cl. 355-20.000.

Stouffer, John D.; and Deak, Ellen Y., to Stouffer Industries Inc. Custom contact printer for selective visual contact printing. 5,070,358, Cl. 355-20.000.

Stracher, Alfred: *See*—
Medina, Victor; Stracher, Alfred; and Kesner, Leo, 5,070,074, Cl. 514-3.000.

Straka, Michael J.; and Ciancanelli, Gino J., to North American Philips Corporation. Protective shield for lamp connections. 5,069,633, Cl. 439-271.000.

Strand, Marc A., to Eastman Kodak Company. Melt phase polyarylate process. 5,070,176, Cl. 528-194.000.

Strang, Harry: *See—*
Fischer, Reiner; Jensen-Korte, Uta; Kunisch, Franz; Marhold, Albrecht; Ooms, Pieter; Schallner, Otto; Santel, Hans-Joachim; Schmidt, Robert R.; and Strang, Harry, 5,069,711, Cl. 71-92.000.

Strange, William M. Golf cart club rack and method. 5,069,481, Cl. 280-769.000.

Strata Flotation, Inc.: *See—*
Johenning, John B., 5,068,934, Cl. 5-450.000.

Street, Michael J.; Benson, John A.; Marchant, John A.; Wilkin, Arthur L.; and Allen, Clive J., to National Research Development Corporation. Automatic milking of animals. 5,069,160, Cl. 119-14.080.

Strickland, Larry D.: *See—*
Bissett, Larry A.; and Strickland, Larry D., 5,069,685, Cl. 48-77.000.

Strom, Yngve: *See—*
Hovland, Heljar; Nilsen, Jan; and Strom, Yngve, 5,069,005, Cl. 51-322.000.

Stryker Corporation: *See—*
Stryker, Martin W.; and Fennell, Thomas W., 5,069,465, Cl. 280-47.371.

Stryker, Martin W.; and Fennell, Thomas W., to Stryker Corporation. Dual position push handles for hospital stretcher. 5,069,465, Cl. 280-47.371.

Stuchlik, Charles F., III. Cleanable condensate trap. 5,069,042, Cl. 62-284.000.

Studiengesellschaft Kohle mbH: *See—*
Bogdanovic, Borislav, 5,069,894, Cl. 423-647.000.

Stueber, Hans-Guenter: *See—*
Schuetz, Guenter; Stueber, Hans-Guenter; and Kinzig, Volker, 5,069,603, Cl. 417-423.400.

Stunkel, Klaus G.: *See—*
Lockhoff, Oswald; Goossens, John; Brunner, Helmut; Sperzel, Michael; and Stunkel, Klaus G., 5,070,190, Cl. 536-22.000.

Stuntz, Gordon F.: *See—*
Culross, Claude C.; Stuntz, Gordon F.; and Winter, William E., Jr., 5,070,053, Cl. 502-64.000.

Sturm, Budd H.; and Kuczkowski, Joseph A., to Goodyear Tire & Rubber Company, The. Thioesters and antioxidant compositions containing the same. 5,069,819, Cl. 252-402.000.

Style-Mark, Inc.: *See—*
Beck, Merle G.; and Beck, Randall S., 5,069,961, Cl. 428-316.600.

Su, Kai C.; and Molock, Frank. Wettable, flexible, oxygen permeable, contact lens containing polyoxyalkylene backbone units, and use thereof. 5,070,166, Cl. 526-301.000.

Su, Kai C.: *See—*
Robertson, J. Richard; Su, Kai C.; Goldenberg, Merrill S.; and Mueller, Karl F., 5,070,169, Cl. 528-25.000.
Robertson, J. Richard; and Su, Kai C., 5,070,170, Cl. 528-25.000.

Su, Tah-Mun: *See—*
Lobos, John H.; Leib, Terry K.; and Su, Tah-Mun, 5,070,017, Cl. 435-170.000.

Subramania, Pazampalaco R.: *See—*
Isayev, Avraam I.; and Subramania, Pazampalaco R., 5,070,157, Cl. 525-444.000.

Subramanian, Munirpallam A.: *See—*
Askew, Thomas R.; Flippen, Richard B.; and Subramanian, Munirpallam A., 5,070,070, Cl. 505-1.000.

Subramanyam, Vinayakam: *See—*
Dumas, Donald J.; and Subramanyam, Vinayakam, 5,069,828, Cl. 260-402.000.

Suda, Haruhisa: *See—*
Syori, Hideichi; and Suda, Haruhisa, 5,068,977, Cl. 34-54.000.

Sudmanns, Hans: *See—*
Deutschmann, Herbert; and Sudmanns, Hans, 5,069,194, Cl. 123-612.000.

Sudol, Marion A.: *See—*
Buckholz, Lawrence L.; Sudol, Marion A.; and Byrne, Brian, 5,069,916, Cl. 426-243.000.

Suehaga, Takashi: *See—*
Kobayashi, Yoshiyuki; Suehaga, Takashi; Mouri, Isamu; and Fujii, Tukasa, 5,069,724, Cl. 134-37.000.

Suekane, Makoto: *See—*
Yamamoto, Masamitsu; Kimura, Noriyuki; Fujioka, Yoshihisa; Yamamoto, Hiroki; and Suekane, Makoto, 5,069,678, Cl. 604-385.100.

Suenaga, Takashi; Fujii, Tukasa; and Kobayashi, Yoshiyuki, to Central Glass Company, Limited. Method of refining nitrogen trifluoride gas. 5,069,887, Cl. 423-240.00V.

Suetsugu, Toshio: *See—*
Katayama, Shigeru; Tominaga, Kaoru; Suetsugu, Toshio; and Matsumoto, Kazumi, 5,070,041, Cl. 437-214.000.

Sugahara, Kazuyuki: *See—*
Ikeda, Tatsuhiko; Sugahara, Kazuyuki; Kusunoki, Shigeru; and Nishioka, Kyusaku, 5,070,030, Cl. 437-31.000.

Sugahara, Satoshi: *See—*
Konushi, Fumihiro; Nakatu, Hiroshi; Inoguchi, Kazuhiko; Okumura, Toshiyuki; Seki, Akinori; Takiguchi, Haruhisa; Nakanishi, Chitose; Sugahara, Satoshi; and Kudo, Hiroaki, 5,070,510, Cl. 372-46.000.

Sugano, Masahi; Murahashi, Takashi; Maruyama, Hiroyuki; and Yokobori, Jun, to Konica Corporation. Color image forming apparatus with an automatic color selection mode. 5,070,367, Cl. 355-326.000.

Sugano, Masashi: *See—*
Murahashi, Takashi; Sugano, Masashi; Maruyama, Hiroyuki; and Yokobori, Jun, 5,070,374, Cl. 355-326.000.

Sugimura, Kentaro; Hasimoto, Shoji; and Ono, Takayuki, to Dowa Mining Co., Ltd. Synthetic resin composition containing gallium particles and use thereof in the glide surfacing material of skis and other applications. 5,069,803, Cl. 252-26.000.

Sugino, Hajime: *See—*
Sumiya, Kazuhiko; and Sugino, Hajime, 5,070,421, Cl. 360-77.070.

Sugiura, Fumitoshi: *See—*
Ozaki, Tatsuhiko; Wada, Hirotaka; and Sugiura, Fumitoshi, 5,070,147, Cl. 525-285.000.

Sugiura, Teruki: *See—*
Yamane, Daiji; Horie, Nobuyuki; Taguchi, Aisaku; and Sugiura, Teruki, 5,070,285, Cl. 318-461.000.

Sugiyama, Kazuo: *See—*
Ohneda, Noboru; Ushioda, Shunta; Arima, Haruo; Hashimoto, Ichiro; Kaneko, Denziro; and Sugiyama, Kazuo, 5,069,055, Cl. 72-283.000.
Ohneda, Noboru; Ushioda, Shunta; Arima, Haruo; Hashimoto, Ichiro; Kaneko, Denziro; Sugiyama, Kazuo; Fukazawa, Tsuguo; Tachi, Teruo; and Mukasa, Takashi, 5,069,095, Cl. 82-124.000.

Sugiyama, Yoshiharu: *See—*
Matsuno, Yuji; Kido, Yoshinobu; and Sugiyama, Yoshiharu, 5,069,084, Cl. 74-844.000.

Sukigara, Mitsunori: *See—*
Hara, Akira; Sukigara, Mitsunori; and Takagi, Toshisaburo, 5,069,128, Cl. 101-425.000.

Sullivan, James R.; Miller, Rodney L.; and Wetzel, Thomas J., to Eastman Kodak Company. Color digital halftoning with vector error diffusion. 5,070,413, Cl. 358-456.000.

Sullivan, Jeffrey M.: *See—*
Birmingham, John M.; and Sullivan, Jeffrey M., 5,069,821, Cl. 252-500.000.

Suman, Michael J.; and Dykstra, Jonathan A., to Prince Corporation. Overhead light. 5,070,434, Cl. 362-74.000.

Sumi, Koji: *See—*
Ibuka, Shigehito; Kondo, Hisashi; Sagami, Shigeru; and Sumi, Koji, 5,070,275, Cl. 315-111.810.

Sumitmo Light Metal Industries, Ltd.: *See—*
Namba, Keizo; Itoh, Yasunaga; and Nakanishi, Hiroshi, 5,069,980, Cl. 428-654.000.

Sumitomo Chemical Co., Ltd.: *See—*
Mizuno, Yukio; Maruyama, Takashi; and Yachigo, Shinichi, 5,070,151, Cl. 525-397.000.
Oyamada, Takeo; Taira, Yoshito; Nitta, Masayoshi; Kaneshima, Yasuo; Kurino, Tateshi; and Narisawa, Shizuo, 5,070,134, Cl. 524-503.000.

Sumitomo Electric Industries, Ltd.: *See—*
Shiga, Nobuo, 5,070,376, Cl. 357-22.000.

Sumitomo Metal Industries, Ltd.: *See—*
Arai, Tetsuzo; Yamamoto, Yasushi; Raijo, Mitsuyuki; and Fujita, Isao, 5,069,929, Cl. 427-54.100.
Iseda, Atsuro; and Sawaragi, Yoshiatsu, 5,069,870, Cl. 420-70.000.
Oishi, Hiroshi; and Maruyama, Akira, 5,069,981, Cl. 428-659.000.

Sumiya, Kazuhiko; and Sugino, Hajime, to Fuji Xerox Co., Ltd. Magnetic disk system having tracking control using recorded information. 5,070,421, Cl. 360-77.070.

Sumiya, Kenji: *See—*
Saito, Osamu; and Sumiya, Kenji, 5,069,973, Cl. 428-421.000.

Summers, Christopher P., to U.S. Philips Corporation. Pulse generators with constant mark/space ratio and small phase modulation jitter. 5,070,254, Cl. 307-261.000.

Sun Microsystems, Inc.: *See—*
Priem, Curtis; and Malachowsky, Chris, 5,070,443, Cl. 395-725.000.

Sunclipse, Inc.: *See—*
Puett, Cecil E., 5,069,018, Cl. 53-427.000.

SunDisk Corporation: *See—*
Yuan, Jack H.; and Harari, Eliyahou, 5,070,032, Cl. 437-43.000.

Sundstrad Data Control, Inc.: *See—*
Hulsing, Rand H., II, 5,070,263, Cl. 310-22.000.

Sundstrand Corporation: *See—*
Grennan, Robert; Rice, John; and Squier, Steven, 5,069,692, Cl. 55-158.000.
Shekleton, Jack R.; Vershure, Roy W., Jr.; and Smith, Robert W., 5,069,031, Cl. 60-39.120.
Shekleton, Jack R., 5,069,033, Cl. 60-39.360.
White, Robert C., 5,069,032, Cl. 60-39.141.

Supnik, Robert M., to Digital Equipment Corporation. Defect tolerant set associative cache. 5,070,502, Cl. 371-11.100.

Surowiec, Roman: *See—*
Boulos, Edward N.; Best, Mark F.; and Surowiec, Roman, 5,070,048, Cl. 501-71.000.

Sussman, Marvin L., to Cordis Corporation. Hydrocephalus valve. 5,069,663, Cl. 604-9.000.

Sutherland, Daniel: *See—*
Travis, Terrell; Shagott, David; Kruse, Gary; Sutherland, Daniel; and Harber, Blair, Jr., 5,069,691, Cl. 55-126.000.

Suzuki, Akira: *See—*
Kitajima, Tomoya; and Suzuki, Akira, 5,069,543, Cl. 356-4.000.

Suzuki, Eiji, to Fujitsu Limited. Spin coating apparatus for forming a photoresist film over a substrate having a non-circular outer shape. 5,069,156, Cl. 118-52.000.

Suzuki Jidosha Kogyo Kabushiki Kaisha: *See—*
Hirano, Sadayuki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 5,069,083, Cl. 74-844.000.

Murano, Katsuaki; Yamashita, Yoshinori; Hirano, Sadayuki; Tatsumi, Takumi; and Yamamoto, Hiroaki, 5,069,086, Cl. 74-866.000.
Suzuki, Junji; and Kawano, Tsutomu, to Mitsubishi Denki Kabushiki Kaisha. Contour compensator for carrier chrominance signal. 5,070,398, Cl. 358-37.000.
Suzuki, Kaneyuki. Flush toilet. 5,068,926, Cl. 4-318.000.
Suzuki, Katsuhisa; and Tokutake, Toshinori, to Showa Aluminum Kabushiki Kaisha. Heat exchanger. 5,069,275, Cl. 165-67.000.
Suzuki, Makoto, to Brother Kogyo Kabushiki Kaisha. Color image recording apparatus using masks for forming latent images on photosensitive recording medium with detection and control of color-separated light components. 5,070,411, Cl. 358-302.000.
Suzuki, Masahiro: *See*—
Ejima, Satoshi; and Suzuki, Masahiro, 5,070,405, Cl. 358-209.000.
Suzuki, Masamichi: *See*—
Kuwabara, Yoshiharu; and Suzuki, Masamichi, 5,069,550, Cl. 356-383.000.
Suzuki, Mitsuo: *See*—
Itami, Yukio; Suzuki, Mitsuo; Ohne, Teruo; Hoshi, Kenichi; Sagae, Eiri; and Hashimoto, Yoshio, 5,069,515, Cl. 359-200.000.
Suzuki Motor company Limited: *See*—
Hirasawa, Kiyoshi, 5,069,483, Cl. 280-801.000.
Suzuki, Noriyuki: *See*—
Tanaka, Atsushi; Kaneko, Kiyoshi; Yoshimura, Yuichiro; Suzuki, Noriyuki; Kobayashi, Katsuyuki; Mori, Shigeki; and Taniishi, Shinnosuke, 5,070,325, Cl. 340-706.000.
Suzuki, Shinobu: *See*—
Fukuda, Yujiro; Utsumi, Shigeo; and Suzuki, Shinobu, 5,070,180, Cl. 528-272.000.
Suzuki, Toshiharu; Goto, Yasuyuki; and Kitano, Kisei, to Chisso Corporation. Benzoic acid derivative having a large positive dielectric anisotropy value. 5,069,814, Cl. 252-299.670.
Suzuki, Toshiro. Shell structure and method of constructing. 5,069,009, Cl. 52-81.000.
Suzuki, Yoshiharu: *See*—
Waketa, Hideharu; Suzuki, Yoshiharu; Murakoshi, Motoharu; Kakiuchi, Hideaki; Ohgushi, Masuhito; Watanabe, Kenichi; and Sawai, Toshiya, 5,069,971, Cl. 428-391.000.
Suzuki, Yutaka: *See*—
Tsutsumi, Yasuhiro; Yokoya, Yuji; Hara, Yoshimichi; Matsunaga, Eiju; Kawata, Hiroyuki; Fukami, Akira; and Suzuki, Yutaka, 5,069,476, Cl. 280-707.000.
Swanson, Hilmer I., to Harris Corporation. RF power amplifier having improved amplifier protection. 5,070,309, Cl. 330-298.000.
Swarthoff, Ton: *See*—
Lagerwaard, Cornelis A.; Cornelissen, Johannes M.; Swarthoff, Ton; Klugkist, Jan; and Thom, David, 5,069,809, Cl. 252-174.120.
Swets, Mark D.; Williams, George A.; and Goodman, Steven F., to Herman Miller, Inc. Pharmaceutical cabinet locking arrangement. 5,069,511, Cl. 312-107.500.
Swiderski, Paul R.; and Seadler, Paul J., to Emerson Electric Co. Rolling tower scaffold and method and tooling apparatus for manufacturing the same. 5,069,309, Cl. 182-119.000.
Swidler, Ronald, to CommTech International Management Corporation. Stain elimination in consecutive color toning. 5,069,995, Cl. 430-115.000.
Swietlik, Joseph M.: *See*—
Marsh, John F.; and Swietlik, Joseph M., 5,069,804, Cl. 252-42.700.
Swinmurn, John: *See*—
Shimirak, Gerald L.; Chan, Paul S.; Kay, John; Croce, Jim; Huynh, Van L.; Swinmurn, John; and Bierlein, Eric, 5,069,636, Cl. 439-412.000.
Sybert, Paul D.: *See*—
Clagett, Donald C.; Fox, Daniel W.; Shafer, Sheldon J.; and Sybert, Paul D., 5,070,177, Cl. 528-196.000.
Sykes, Christopher C., to Click Systems Limited. Display cabinets. 5,069,512, Cl. 312-139.200.
Syori, Hideichi; and Suda, Haruhisa, to Central Glass Company, Limited. Apparatus for removing water from curved glass panel after washing in production line. 5,068,977, Cl. 34-54.000.
Syron-Townson, Ann T.; and Townson, James A. Computerized door locking and monitoring system using power-line carrier components. 5,070,442, Cl. 364-146.000.
Szlam, Aleksander; Crooks, James W., Jr.; and Warner, Charles L., II, to Inventions, Inc. Method for avoiding call blocking. 5,070,525, Cl. 379-196.000.
Szoke, Istvan: *See*—
Einhorn, Robert K.; and Szoke, Istvan, 5,070,321, Cl. 340-608.000.
S2 Yachts Incorporated: *See*—
Smith, Scott A., 5,069,414, Cl. 248-638.000.
T. A. Pelsue Company: *See*—
Niksic, Mark R., 5,069,572, Cl. 403-170.000.
T.D.F. Partnership: *See*—
Barrett, Phillip L., 5,069,073, Cl. 73-756.000.
T&N plc: *See*—
Bruce, John S., 5,068,963, Cl. 29-888.073.
Ta, Paul D., to VLSI Technology, Inc. Differential amplifier with enhanced slew rate. 5,070,307, Cl. 330-253.000.
Tachi, Teruo: *See*—
Ohneda, Noboru; Ushioda, Shunta; Arima, Haruo; Hashimoto, Ichiro; Kaneko, Denziro; Sugiyama, Kazuo; Fukazawa, Tsuguo; Tachi, Teruo; and Mukasa, Takashi, 5,069,095, Cl. 82-124.000.
Tachikawa, Hiromichi; Yokoya, Hiroaki; Watarai, Syu; and Aoai, Toshiaki, to Fuji Photo Film Co., Ltd. Electrophotographic printing plate precursor containing alkali-soluble polyurethane resin as binder resin. 5,069,992, Cl. 430-49.000.
Tackett, James E., Jr., to Marathon Oil Company. Process for enhanced delayed in situ gelation of chromium polyacrylamide gels. 5,069,281, Cl. 166-295.000.
Tada, Takahisa: *See*—
Yarita, Kenichi; Tada, Takahisa; and Kasatani, Ryuichiro, 5,070,208, Cl. 548-494.000.
Tagawa, Shinichi: *See*—
Yonekawa, Takashi; Buma, Shuuichi; Aburaya, Toshio; Sato, Kunihito; Kawanishi, Masaki; Hamada, Toshiaki; and Tagawa, Shinichi, 5,069,475, Cl. 280-707.000.
Taguchi, Aisaku: *See*—
Yamane, Daiji; Horie, Nobuyuki; Taguchi, Aisaku; and Sugiura, Teruki, 5,070,285, Cl. 318-461.000.
Taheri, Syde A. Method and apparatus for removing venous valves. 5,069,679, Cl. 606-159.000.
Tai, Huang M. Doll-carriages. 5,069,474, Cl. 280-658.000.
Taira, Yoshito: *See*—
Oyamada, Takeo; Taira, Yoshito; Nitta, Masayoshi; Kaneshima, Yasuo; Kurino, Tateshi; and Narisawa, Shizuo, 5,070,134, Cl. 524-503.000.
Taiyo Yuden Co., Ltd.: *See*—
Imai, Mizuho; Sekiguchi, Mikio; Shiba, Nobuyasu; and Iida, Hideyo, 5,069,157, Cl. 118-314.000.
Takada, Masahiko: *See*—
Sasaki, Yoshikazu; Oohara, Takaaki; and Takada, Masahiko, 5,070,422, Cl. 360-85.000.
Takada, Mitsuyuki: *See*—
Ohuchida, Hirofumi; Gofuku, Eishi; Takasago, Hayato; Ishizu, Akira; Tobita, Toshio; and Takada, Mitsuyuki, 5,069,745, Cl. 156-630.000.
Takada, Seiji: *See*—
Kotani, Takaaki; and Takada, Seiji, 5,070,352, Cl. 354-402.000.
Takagawa, Ryozo: *See*—
Nakano, Shinji; Ohsugi, Hiroharu; Nakae, Yasuhiko; Tanabe, Hisaki; Takagawa, Ryozo; Eguchi, Yoshio; Tsutsui, Koichi; and Endo, Takeshi, 5,070,161, Cl. 526-193.000.
Takagi, Akira: *See*—
Mochizuki, Seiji; Naka, Takahiro; Hara, Kazuhiko; Takagi, Akira; and Hanaoka, Yukihiro, 5,070,346, Cl. 346-140.00R.
Takagi, Toshisaburo: *See*—
Hara, Akira; Sukigara, Mitsunori; and Takagi, Toshisaburo, 5,069,128, Cl. 101-425.000.
Takahashi, Atsuhisa: *See*—
Kakuma, Satoshi; Takahashi, Atsuhisa; and Uchida, Yoshihiro, 5,070,498, Cl. 370-60.000.
Takahashi, Kazushi, to Canon Denshi Kabushiki Kaisha. Cassette ejection apparatus. 5,070,418, Cl. 360-71.000.
Takahashi, Koichi: *See*—
Niinomi, Toshihiko; Funakoshi, Ryohei; Kaseda, Shigeru; and Takahashi, Koichi, 5,070,468, Cl. 364-550.000.
Takahashi, Kotaro, to Citizen Watch Co., Ltd. Portable display equipment. 5,069,529, Cl. 359-601.000.
Takahashi, Masao: *See*—
Kakino, Shigeru; Nakamura, Tatsushi; Tamari, Toshinori; and Takahashi, Masao, 5,069,132, Cl. 102-331.000.
Takahashi, Noriko: *See*—
Saito, Masao; Tsukahara, Kengo; Takahashi, Noriko; and Onda, Yuzi, 5,070,059, Cl. 502-206.000.
Takaki, Satoshi: *See*—
Echizen, Hiroshi; and Takaki, Satoshi, 5,069,928, Cl. 427-45.100.
Takano, Makoto; Hoshi, Yasuhiko; Kurakazu, Keiichi; and Baba, Shiro, to Hitachi, Ltd.; and Hitachi Microcomputer Engineering Ltd. Microprocessor. 5,070,473, Cl. 395-725.000.
Takasago, Hayato: *See*—
Ohuchida, Hirofumi; Gofuku, Eishi; Takasago, Hayato; Ishizu, Akira; Tobita, Toshio; and Takada, Mitsuyuki, 5,069,745, Cl. 156-630.000.
Takashima, Kohki: *See*—
Iwasaki, Tameo; and Takashima, Kohki, 5,070,103, Cl. 514-463.000.
Takasu, Hiroshi; Arase, Susumu; Yokota, Junichiro; and Nakayama, Kazuo, to Chisso Corporation; and Agency of Industrial Science and Technology. Process for preparing rolled heat-treated films or sheets. 5,069,855, Cl. 264-235.000.
Takata, Hiroshi: *See*—
Ohara, Osamu; Takata, Hiroshi; and Kawashima, Hiroshi, 5,069,141, Cl. 105-30.000.
Takatsuka, Hiromichi; and Kosaka, Tetsuzo, to Nissan Motor Co., Ltd. Window heater controlling apparatus providing a gradual heating voltage. 5,070,229, Cl. 219-203.000.
Takayama, Seiji: *See*—
Yamada, Yasuhiro; Sakuda, Shohei; and Takayama, Seiji, 5,070,191, Cl. 536-22.000.
Takayama, Yukio; and Yuge, Yuko, to Nihon Plast Co., Ltd. Damper control arrangement. 5,069,112, Cl. 98-69.000.
Takeba, Go; and Tanaka, Osamu, to Ajinomoto Co., Inc. Method for regulating the flowering of plants and flowering regulators of plants. 5,069,707, Cl. 71-86.000.
Takeda, Hiromitsu: *See*—
Masaki, Mitsuo; Yamakawa, Tomio; Satoh, Masaru; Takeda, Hiromitsu; Yoshino, Yasushi; and Matsukura, Hitoshi, 5,070,089, Cl. 514-255.000.
Takeda, Katsumi: *See*—
Kubo, Kanji; Yamamoto, Akio; and Takeda, Katsumi, 5,070,444, Cl. 395-425.000.
Takeda, Shin: *See*—
Yabuno, Ryohei; and Takeda, Shin, 5,068,964, Cl. 29-892.300.

Takenaka, Satoshi: *See*—
Amino, Toshikazu; and Takenaka, Satoshi, 5,070,049, Cl. 501-88.000.

Takeuchi, Hideaki: *See*—
Nakada, Junji; Takeuchi, Hideaki; and Yasunaga, Tadashi, 5,069,932, Cl. 427-129.000.

Takeuchi, Hiroshi; and Masaki, Michitomo, to Kabushiki Kaisha Daiken Seisakusho. Release bearing including replaceable bush. 5,069,323, Cl. 192-110.00B.

Takeuchi, Kunihiko: *See*—
Horinouchi, Shinichi; and Takeuchi, Kunihiko, 5,070,500, Cl. 370-69.100.

Takeuchi, Shogo: *See*—
Kitazawa, Hideki; Terada, Ryohei; Takeuchi, Shogo; Kayama, Tsutomu; Tanimoto, Kohichi; Utsugi, Nobuo; and Nagai, Yoshiaki, 5,070,431, Cl. 362-31.000.

Takeuchi, Tadao: *See*—
Taniguchi, Naohiro; Koike, Syuzo; Watanabe, Yasuhiko; Takeuchi, Tadao; and Fujiwara, Noboru, 5,069,784, Cl. 210-205.000.

Takeyama, Atushi: *See*—
Okuyama, Nobutaka; Sakurai, Soichi; Kitou, Kouji; Ohsawa, Michitaka; Niitsu, Ichiro; Yoshioka, Hiroshi; Takeyama, Atushi; Obara, Masao; and Yoshimi, Isao, 5,070,280, Cl. 315-368.110.

Takiguchi, Haruhisa: *See*—
Konushi, Fumihiro; Nakatu, Hiroshi; Inoguchi, Kazuhiko; Okumura, Toshiyuki; Seki, Akinori; Takiguchi, Haruhisa; Nakanishi, Chitose; Sugahara, Satoshi; and Kudo, Hiroaki, 5,070,510, Cl. 372-46.000.

Takizawa, Toshio; and Hirata, Hiroharu, to Oki Electric Industry Co., Ltd. IC card reader/writer and IC card transactions processing apparatus capable of producing various frequency clock pulses. 5,070,233, Cl. 235-380.000.

Tamagaki, Akira; and Iwai, Shougo, to Sharp Kabushiki Kaisha. Copying machine with a slidefilm exposure device. 5,070,360, Cl. 355-40.000.

Tamaki, Jun; and Sata, Nobuyuki, to Mabuchi Motor Co., Ltd. Miniature motor having a frequency generator. 5,070,269, Cl. 310-171.000.

Tamari, Toshinori: *See*—
Kakino, Shigeru; Nakamura, Tatsushi; Tamari, Toshinori; and Takahashi, Masao, 5,069,132, Cl. 102-331.000.

Tamura, Akira; Watanabe, Naotaka; Fujiyoshi, Hitoshi; and Shirota, Masako, to Mitsui-Cyanamid, Ltd. Mortar concrete composition. 5,069,721, Cl. 106-724.000.

Tan, David: *See*—
Tan, Palatan L. J.; Tan, David; and Tan, Richard, 5,069,147, Cl. 110-349.000.

Tan, Palatan L. J.; Tan, David; and Tan, Richard. Touring system for a waste processing plant. 5,069,147, Cl. 110-349.000.

Tan, Richard: *See*—
Tan, Palatan L. J.; Tan, David; and Tan, Richard, 5,069,147, Cl. 110-349.000.

Tanabe, Hisaki: *See*—
Nakano, Shinji; Ohsugi, Hiroharu; Nakae, Yasuhiko; Tanabe, Hisaki; Takagawa, Ryozo; Eguchi, Yoshio; Tsutsui, Koichi; and Endo, Takeshi, 5,070,161, Cl. 526-193.000.

Tanabe Seiyaku Co., Ltd.: *See*—
Iwasaki, Tameo; and Takashima, Kohki, 5,070,103, Cl. 514-463.000.

Tanaka, Atsushi; Kaneko, Kiyoshi; Yoshimura, Yuichiro; Suzuki, Noriyuki; Kobayashi, Katsuyuki; Mori, Shigeki; and Taniishi, Shinnosuke, to Canon Kabushiki Kaisha. Coordinate input apparatus. 5,070,325, Cl. 340-706.000.

Tanaka, Hiroyuki: *See*—
Kouzuma, Shinichi; Inoue, Hiroshi; Murata, Kenji; Tanaka, Hiroyuki; and Kishi, Yasuo, 5,069,727, Cl. 136-251.000.

Tanaka, Kazuhiko, to Nippon Thompson, Co., Ltd. Linear motion ball bearing. 5,069,088, Cl. 74-89.150.

Tanaka, Kazuna: *See*—
Moyher, George C., Jr.; Jamerson, Randy; Nessim, David; Kapec, Jeffrey; Tanaka, Kazuna; and Chochinov, Allan, 5,069,782, Cl. 210-192.000.

Tanaka, Kunimaro: *See*—
Ogawa, Masaharu; Nakajima, Yoshiki; Ito, Osamu; Furukawa, Teruo; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Ototake, Masafumi; and Ozaki, Minoru, 5,070,492, Cl. 369-47.000.

Tanaka, Osamu: *See*—
Takeba, Go; and Tanaka, Osamu, 5,069,707, Cl. 71-86.000.

Tanaka, Yukiyasu: *See*—
Murata, Masahiro; Tanaka, Yukiyasu; and Kokawa, Tomoo, 5,069,956, Cl. 428-216.000.

Tani, Hisashi; and Yagi, Hisanori, to Kanzaki Paper Mfg. Co., Ltd. Heat-sensitive recording material. 5,070,067, Cl. 503-219.000.

Tani, Noriaki: *See*—
Nakamura, Kyuzo; Ota, Yoshifumi; Ishikawa, Michio; Tani, Noriaki; Hashimoto, Masanori; and Murata, Yuzo, 5,069,983, Cl. 428-694.000.

Taniguchi, Mitsuhiro: *See*—
Hattori, Kazuo; and Taniguchi, Mitsuhiro, 5,070,035, Cl. 437-184.000.

Taniguchi, Naohiro; Koike, Syuzo; Watanabe, Yasuhiko; Takeuchi, Tadao; and Fujiwara, Noboru, to Japan Sewage Works Agency; and Kurita Water Industries Ltd. Coagulation reaction tank. 5,069,784, Cl. 210-205.000.

Taniguchi, Nobuyuki: *See*—
Inoue, Manabu; Taniguchi, Nobuyuki; Nanba, Katsuyuki; Kudo, Yoshinobu; Iwata, Michihiro; and Wada, Shigeru, 5,070,355, Cl. 354-413.000.

Taniguchi, Shunro: *See*—
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 5,070,172, Cl. 528-76.000.

Taniguchi, Takao; Tsukamoto, Kazumasa; Hayabuchi, Masahiro; and Noda, Koji, to Aisin A W Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Automatic transmission. 5,069,657, Cl. 475-283.000.

Taniishi, Shinnosuke: *See*—
Tanaka, Atsushi; Kaneko, Kiyoshi; Yoshimura, Yuichiro; Suzuki, Noriyuki; Kobayashi, Katsuyuki; Mori, Shigeki; and Taniishi, Shinnosuke, 5,070,325, Cl. 340-706.000.

Tanimoto, Kohichi: *See*—
Kitazawa, Hideki; Terada, Ryohei; Takeuchi, Shogo; Kayama, Tsutomu; Tanimoto, Kohichi; Utsugi, Nobuo; and Nagai, Yoshiaki, 5,070,431, Cl. 362-31.000.

Tannenbaum, Michael A., to Delvo Industries, Inc. Openable/closeable container including a frame for supporting a pair of tray members. 5,069,354, Cl. 220-4.220.

Tanner, Clarence T.: *See*—
Roensch, L. Frederick; Chang, Kelvin Y.; and Tanner, Clarence T., 5,069,286, Cl. 166-312.000.

Tanous, Adam C.: *See*—
Dupon, Ryan W.; Thompson, Mark S.; Wiseman, Gary H.; Musolf, Douglas J.; and Tanous, Adam C., 5,070,050, Cl. 501-108.000.

Tardo, Joseph J.: *See*—
Hawe, William R.; Tardo, Joseph J.; Kaufman, Charles W.; Gupta, Amar; Spinney, Barry A.; and Waters, Gregory M., 5,070,528, Cl. 380-48.000.

Tateno, Haruo: *See*—
Yoshikawa, Masanori; Tateno, Haruo; Obana, Hiroshi; Itoh, Tsutomu; Saitoh, Hiroshi; and Kitoh, Masayuki, 5,070,274, Cl. 315-111.210.

Tatham, Gerald F. Automatic sliding door latch. 5,069,492, Cl. 292-85.000.

Tatsumi, Takumi: *See*—
Hirano, Sadayuki; Yamashita, Yoshinori; Tatsumi, Takumi; and Yamamoto, Hiroaki, 5,069,083, Cl. 74-844.000.
Murano, Katsuaki; Yamashita, Yoshinori; Hirano, Sadayuki; Tatsumi, Takumi; and Yamamoto, Hiroaki, 5,069,086, Cl. 74-866.000.

Tatum, Gary: *See*—
Kendrick, Ray; and Tatum, Gary, 5,069,252, Cl. 138-44.000.

Tayefeh, Morovat: *See*—
Bletscher, Warren L., Jr.; Lewkowicz, Julian; and Tayefeh, Morovat, 5,070,495, Cl. 369-116.000.

Taylor, David F., Jr., to OCA Applied Optics, Inc. Pixel addressing in a ferroelectric liquid crystal array. 5,069,532, Cl. 359-56.000.

Taylor, Donald J.; Zumo, Anthony G.; and Bussema, John R., to Woodhead Industries, Inc. Connector module for transducer. 5,069,072, Cl. 73-756.000.

Taylor, Stephen E.: *See*—
Cole, Howard W., Jr.; and Taylor, Stephen E., 5,069,723, Cl. 134-25.100.

Taylor, William T. Mechanical down jar mechanism. 5,069,282, Cl. 166-301.000.

TDK Corporation: *See*—
Yokoyama, Kenji; Nakayama, Masatoshi; Shimozawa, Toru; Ueda, Kunihiro; and Maruta, Fumio, 5,069,967, Cl. 428-336.000.

Tegel, Anita, sole heir: *See*—
Tegel, Marek, deceased; and Wenzel, Dieter, 5,069,398, Cl. 244-3.120.

Tegel, Marek, deceased (by Tegel, Anita, sole heir); and Wenzel, Dieter, to DMT Marinetechnik GmbH. Guide cable protection for air rockets. 5,069,398, Cl. 244-3.120.

Teijin Limited: *See*—
Hironori, Yamada, 5,070,178, Cl. 528-272.000.
Yamagishi, Takashi; Yamamoto, Yukito; and Murakami, Yoji, 5,069,944, Cl. 427-444.000.

Teikoku Kuromu Co., Ltd.: *See*—
Yasuno, Toshio; Thukagoshi, Toshihiro; Hoshii, Shinji; and Imaizumi, Yasuo, 5,069,089, Cl. 76-107.100.

Teikoku Piston Ring Co., Ltd.: *See*—
Nakazawa, Ribun, 5,070,343, Cl. 346-76.0PH.

Tel Sagami Limited: *See*—
Kinoshita, Kenichi, 5,065,591, Cl. 414-156.000.

Teldix GmbH: *See*—
Janczak, Christian; and Schopp, Richard, 5,070,266, Cl. 310-77.000.

Telectronics Pacing Systems, Inc.: *See*—
Posin, Jack, 5,069,209, Cl. 128-419.00P.

Telefonaktiebolaget L M Ericsson: *See*—
Dent, Paul W., 5,070,303, Cl. 328-145.000.
Gladh, Olov H.; and Kagstrom, Leif S., 5,070,313, Cl. 333-202.000.

Ten Eyck, Timothy A., to Texas Instruments Incorporated. Apparatus and method for translating voltages. 5,070,261, Cl. 307-475.000.

Teng, Lina C.; Walsh, David A.; and Shanklin, James R., Jr., to A. H. Robins Company, Incorporated. Aryl(alkyland alkylene)-N-((phenoxy and phenylthio)alkyl) aminoheterocyclics as cardiovascular, anthihistaminic, antisecretory and antiallergy agents. 5,070,087, Cl. 514-212.000.

Tennessee Valley Authority: *See*—
Austin, Garey, 5,069,695, Cl. 55-385.100.

Terada, Ryohei: *See*—
Kitazawa, Hideki; Terada, Ryohei; Takeuchi, Shogo; Kayama, Tsutomu; Tanimoto, Kohichi; Utsugi, Nobuo; and Nagai, Yoshiaki, 5,070,431, Cl. 362-31.000.

Terashima, Akira: *See*—
Ohira, Sakari; Yamaki, Masatoshi; Terashima, Akira; and Ozawa, Masaaki, 5,070,537, Cl. 455-67.000.
Term-ac S.A.: *See*—
Noppel, Rene ; and Wuillemin, Kurt, 5,069,208, Cl. 128-403.000.
Terumo Kabushiki Kaisha: *See*—
Ikeda, Makoto, 5,069,218, Cl. 128-670.000.
Okamura, Toshio, 5,069,225, Cl. 128-765.000.
Yamauchi, Kiyoshi; Kugo, Takahiro; and Miyano, Yasuo, 5,069,226, Cl. 128-772.000.
Teset A.G.: *See*—
Dethier, Louis, 5,069,146, Cl. 110-281.000.
Tessier, Noel J.: *See*—
Block, Jacob; Tessier, Noel J.; and Colageo, Anthony J., 5,069,702, Cl. 65-21.400.
Tetra Pak Holding & Finance S.A.: *See*—
Reil, Wilhelm; Deutschbein, Ulrich; and Liebram, Udo, 5,069,021, Cl. 53-563.000.
Teutsch, Erich O.; and Coyle, Dennis J., to General Electric Corporation. Modular tubular extrusion head. 5,069,612, Cl. 425-133.100.
Tews, Helmut; and Zwicknagl, Hans-Peter, to Siemens Aktiengesellschaft. Method for manufacturing bipolar transistors having extremely reduced base-collection capacitance. 5,070,028, Cl. 437-22.000.
Texaco Inc.: *See*—
Dai, Pei-Shing E.; Sherwood, David E., Jr.; and Martin, Bobby R., 5,069,890, Cl. 423-328.000.
Muan, Arnulf; and Najjar, Mitri S., 5,070,065, Cl. 502-341.000.
Sawicki, Robert A.; and Harrison, Jeffrey B., 5,070,058, Cl. 502-206.000.
Texas Instruments Incorporated: *See*—
Hashimoto, Masashi, 5,070,262, Cl. 307-475.000.
Johnson, Richard E.; Davis, Dennis D.; Kee, David R.; Orcutt, John W.; and Hightower, Angus W., 5,070,039, Cl. 437-207.000.
Kwon, Oh-Kyong; Hashimoto, Masashi; Malhi, Satwinder; and Born, Eng C., 5,070,297, Cl. 324-158.00P.
Levine, Jules D.; and Jensen, Millard J., 5,069,740, Cl. 156-616.200.
Scott, David B.; and Tran, Hiep V., 5,070,381, Cl. 357-35.000.
Ten Eyck, Timothy A., 5,070,261, Cl. 307-475.000.
Thalmann, William H.; and Siegler, Thomas W., to Infinitex. Ultrafiltration device and process. 5,069,780, Cl. 210-90.000.
Theeuwes, Felix, to ALZA Corporation. Intravenous medication. 5,069,671, Cl. 604-251.000.
Thielman, David E.; Welch, Dennis E.; and Bezat, Theodore P., to McLean Midwest Corporation. Method and apparatus for electromechanical air conditioning of industrial electronics. 5,069,041, Cl. 62-263.000.
Thinking Machines Corporation: *See*—
Salem, James B., 5,070,446, Cl. 395-500.000.
Thom, David: *See*—
Lagerwaard, Cornelis A.; Cornelissen, Johannes M.; Swarthoff, Ton; Klugkist, Jan; and Thom, David, 5,069,809, Cl. 252-174.120.
Thomas, David M.: *See*—
Kaller, Roy S.; and Thomas, David M., 5,070,332, Cl. 341-156.000.
Thomas, William F. Golf putting trainer. 5,069,455, Cl. 273-176.00H.
Thompson, James E., II: *See*—
Hicks, Clark T.; Hoffman, Ray D.; and Thompson, James E., II, 5,069,851, Cl. 264-171.000.
Thompson, Mark S.: *See*—
Dupon, Ryan W.; Thompson, Mark S.; Wiseman, Gary H.; Musolf, Douglas J.; and Tanous, Adam C., 5,070,050, Cl. 501-108.000.
Thompson, Paul D.; and Steingraber, Gary C., to DEC International, Inc. Teat cup inflation. 5,069,162, Cl. 119-14.470.
Thompson, Paul D.: *See*—
Smith, Douglas J.; and Thompson, Paul D., 5,069,595, Cl. 414-462.000.
Thomson CSF: *See*—
Penven, Paul; Michel, Philippe; Jerome, Denis; and Moradpour, Alexandre, 5,070,214, Cl. 556-64.000.
Thomson Industries, Inc.: *See*—
Mugglestone, Peter R.; and Ng, Alison, 5,069,555, Cl. 384-43.000.
Thomson Microelectronics S. R. L.: *See*—
Confalonieri, Pierangelo; and Nicollini, Germano, 5,070,305, Cl. 330-69.000.
Thomson Tubes Electroniques: *See*—
Epsztein, Bernard, 5,070,282, Cl. 315-383.000.
Thor Technology Corporation: *See*—
Polczynski, Mark H., 5,069,213, Cl. 128-633.000.
Thorn EMI plc: *See*—
Seymour, Colin J.; Steel, Martin C.; and Trumble, Francis R., 5,070,278, Cl. 315-248.000.
Thornton, Steven L., to Chomerics, Inc. EMI shielding gasket. 5,070,216, Cl. 174-35.0GC.
Thow, Ian; and Gupta, Ajay K., to Valor Incorporated. Gas-fired artificial log assembly. 5,069,200, Cl. 126-512.000.
Thukagoshi, Toshihiro: *See*—
Yasuno, Toshio; Thukagoshi, Toshihiro; Hoshii, Shinji; and Imaizumi, Yasuo, 5,069,089, Cl. 76-107.100.
Ting, Sai-Pei: *See*—
Aycock, David F.; and Ting, Sai-Pei, 5,069,818, Cl. 525-397.000.
Tischer, Kurt M.: *See*—
Nill, Eberhard; and Tischer, Kurt M., 5,069,733, Cl. 156-67.000.
Titmus Eurocon Kontaktlinsen GmbH & Co. KG.: *See*—
Hofer, Peter; Muller, Ulrich; Barenz, Manfred; Schafer, Horst; and Muller-Lierheim, Wolfgang, 5,069,542, Cl. 351-160.00H.
Titus, Charles H. Well drilling assembly. 5,069,298, Cl. 175-107.000.
Tjahjadi, Taruna, to Hayes Microcomputer Products, Inc. Method and apparatus for clearing data path in half duplex modem receiver while maintaining dynamic parameters. 5,070,514, Cl. 375-14.000.
TMC Corporation: *See*—
Erdei, Roland, 5,069,473, Cl. 280-605.000.
Tobiason, Timothy W., to Toby's Chemical Company. Method and compound for clearing flora from sewer lines using organic herbicides. 5,069,706, Cl. 71-65.000.
Tobinaga, Kenshiro: *See*—
Sakamoto, Hiroyuki; Tobinaga, Kenshiro; and Tsuchiya, Yasuyuki, 5,070,120, Cl. 523-412.000.
Tobita, Toshio: *See*—
Ohuchida, Hirofumi; Gofuku, Eishi; Takasago, Hayato; Ishizu, Akira; Tobita, Toshio; and Takada, Mitsuyuki, 5,069,745, Cl. 156-630.000.
Toby's Chemical Company: *See*—
Tobiason, Timothy W., 5,069,706, Cl. 71-65.000.
Todome, Tuyoshi, to Kabushiki Kaisha Toshiba. Method and apparatus for combination information display and input operations. 5,070,467, Cl. 395-166.000.
Togai, Kazuhide; Danno, Yoshiaki; Yoshida, Masato; Shimada, Makoto; and Ueda, Katsunori, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Output control apparatus for an internal combustion engine. 5,069,181, Cl. 123-399.000.
Tohoku Electric Power Co., Inc.: *See*—
Ohira, Sakari; Yamaki, Masatoshi; Terashima, Akira; and Ozawa, Masaaki, 5,070,537, Cl. 455-67.000.
Tojo, Tetsuro: *See*—
Watanabe, Nobuatsu; Tojo, Tetsuro; Chong, Yong-bo; and Ikari, Kenji, 5,069,764, Cl. 204-60.000.
Tokai Carbon Co., Ltd.: *See*—
Nakai, Kiyonari, 5,069,892, Cl. 423-445.000.
Tokiai, Takeo; and Uesugi, Takashi, to Idemitsu Petrolchemical Co., Ltd. Method for producing thermoelectric elements. 5,069,868, Cl. 419-23.000.
Tokico Ltd.: *See*—
Saitoh, Takashi; and Fukui, Kohji, 5,069,605, Cl. 418-55.200.
Tokin Corporation: *See*—
Yamauchi, Kiyoshi; Kugo, Takahiro; and Miyano, Yasuo, 5,069,226, Cl. 128-772.000.
Tokishige, Masato: *See*—
Okano, Tokiyuki; Inamoto, Kiyoshi; Ohnishi, Kazuyuki; Nishiyama, Hidetomo; Sohda, Kazunori; Tokishige, Masato; and Shimazawa, Yoichi, 5,070,368, Cl. 355-246.000.
Tokoli, Emery G.: *See*—
Robinette, Susan; Mammino, Joseph; Carmichael, Kathleen M.; Tokoli, Emery G.; Lynch, Anita P.; and Yu, Robert C. U., 5,069,993, Cl. 430-58.000.
Tokutake, Toshinori: *See*—
Suzuki, Katsuhisa; and Tokutake, Toshinori, 5,069,275, Cl. 165-67.000.
Tokyo Electron Limited: *See*—
Ibuka, Shigehito; Kondo, Hisashi; Sagami, Shigeru; and Sumi, Koji, 5,070,275, Cl. 315-111.810.
Tokyo Institute of Technology, President of: *See*—
Yamane, Masayuki; and Yasumori, Atsuo, 5,069,700, Cl. 65-17.000.
Tokyo Keiki Company Ltd.: *See*—
Horinouchi, Shinichi; and Takeuchi, Kunihiko, 5,070,500, Cl. 370-69.100.
Tokyo KiKai Seisakusho, Ltd.: *See*—
Iijima, Takashi; and Kawashima, Shinji, 5,069,127, Cl. 101-415.100.
Tolco Corporation: *See*—
Potter, Terry C., 5,069,245, Cl. 137-218.000.
Tolisano, Thomas: *See*—
Massaro, Bruno A., 5,068,927, Cl. 4-480.000.
Tolliver, Howard R.; Bailey, Terry R.; and Bergeson, David L., to Minnesota Mining and Manufacturing Company. Flexible, substrate-insular retroreflective sheeting. 5,069,964, Cl. 428-325.000.
Tomantschger, Klaus; Kordesch, Karl; and Findlay, Robert D., to Battery Technologies Inc. Metal and metal oxide catalyzed electrodes for electrochemical cells, and methods of making same. 5,069,988, Cl. 429-59.000.
Tominaga, Akira, to Kansai Paint Co., Ltd. Method of electrodeposition coating, and water-base paint resin composition. 5,069,767, Cl. 204-181.700.
Tominaga, Kaoru: *See*—
Katayama, Shigeru; Tominaga, Kaoru; Suetsugu, Toshio; and Matsumoto, Kazumi, 5,070,041, Cl. 437-214.000.
Tomotsu, Norio; Maezawa, Hiroshi; and Yamamoto, Koji, to Idemitsu Kosan Co., Ltd. Process for drying aluminoxane and process for producing polymers. 5,070,160, Cl. 526-165.000.
Tompkins, Dale A.; and Sicka, Richard W., to Bridgestone/Firestone, Inc. Coextrusion apparatus and method using a rigid die for varying the outer profile of a tubular extrudate. 5,069,850, Cl. 264-167.000.
Tontarelli, Sergio. Picture display receptacle. 5,068,987, Cl. 40-152.100.
Topfer, Klaus; and Popp, Konrad J., to Nassovia Werkzeugmaschinen GmbH. Wire erosion machine. 5,070,224, Cl. 219-69.120.
Toray Industries, Inc.: *See*—
Okazaki, Iwao; Abe, Koichi; and Nakajima, Shoji, 5,069,962, Cl. 428-323.000.
Torimae, Yasuhiro: *See*—
Sakurai, Akira; and Torimae, Yasuhiro, 5,069,677, Cl. 604-370.000.
Torneros, Maximiano D.: *See*—
Koza, John R.; Ferguson, John R.; and Torneros, Maximiano D., 5,069,453, Cl. 273-139.000.

Toshima, Hirotaka: *See*—
Shirosaki, Takehiro; Kikkawa, Takashi; and Toshima, Hirotaka, 5,069,874, Cl. 420-478.000.
Tosoh Corporation: *See*—
Iwata, Hiroo; Miyaki, Yoshiyuki; and Nakamura, Hiroaki, 5,069,926, Cl. 427-40.000.
Toto Ltd.: *See*—
Ito, Haruyuki; and Matsumoto, Akio, 5,069,609, Cl. 425-84.000.
Touhsaent, Robert E.: *See*—
Min, Taeik; and Touhsaent, Robert E., 5,070,164, Cl. 526-286.000.
Touma, Alfred S.: *See*—
Gorzegno, Walter P.; Abdulally, Iqbal F.; Phalen, John W.; and Touma, Alfred S., 5,069,170, Cl. 122-4.00D.
Towner, David K.: *See*—
Marshall, Daniel R.; Campbell, David K.; Bell, Bernard W., Jr.; and Towner, David K., 5,070,493, Cl. 369-112.000.
Townson, James A.: *See*—
Syron-Townson, Ann T.; and Townson, James A., 5,070,442, Cl. 364-146.000.
Toyo Engineering Corporation: *See*—
Bendix, Horst; Hochmuth, Bernd; Johannes, Dieter; Lakenmacher, Bodo; Lausch, Winfried; and Schuebel, Klaus, 5,069,891, Cl. 423-359.000.
Toyoda Gosei Co., Ltd.: *See*—
Shiraki, Kouji, 5,069,477, Cl. 280-732.000.
Toyoda, Yoshiharu, to Yamato Scale Company, Limited. Calibration system for a combination weighing apparatus. 5,069,300, Cl. 177-25.180.
Toyonishi, Shigekazu; and Nakajima, Takashi, to Aicello Chemical Co., Ltd. Films easily soluble in cold water. 5,070,126, Cl. 524-224.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Kayanuma, Nobuaki, 5,069,035, Cl. 60-274.000.
Taniguchi, Takao; Tsukamoto, Kazumasa; Hayabuchi, Masahiro; and Noda, Koji, 5,069,657, Cl. 475-283.000.
Tsutsumi, Yasuhiro; Yokoya, Yuji; Hara, Yoshimichi; Matsunaga, Eiju; Kawata, Hiroyuki; Fukami, Akira; and Suzuki, Yutaka, 5,069,476, Cl. 280-707.000.
Yonekawa, Takashi; Buma, Shuuichi; Aburaya, Toshio; Sato, Kunihito; Kawanishi, Masaki; Hamada, Toshiaki; and Tagawa, Shinichi, 5,069,475, Cl. 280-707.000.
Toyoto Jidosha Kabushiki Kaisha: *See*—
Kato, Senji; and Oba, Hidehiro, 5,069,184, Cl. 123-422.000.
Traber, Jorg; and Bielenberg, Gerhard-Wilhelm, to Troponwerke GmbH & Co. Medicaments for the treatment of cerebral apoplexy. 5,070,102, Cl. 514-415.000.
Trainor, Robert J., Jr.; Bardo, Samuel B.; and Leonard, David A., to Doralco, Inc. Glass door or partition support rail. 5,069,010, Cl. 52-127.800.
Tran, Hiep V.: *See*—
Scott, David B.; and Tran, Hiep V., 5,070,381, Cl. 357-35.000.
Trapp, Joachim: *See*—
Muller, Hans; and Trapp, Joachim, 5,069,559, Cl. 384-277.000.
Travis, Terrell; Shagott, David; Kruse, Gary; Sutherland, Daniel; and Harber, Blair, Jr., to Abatement Technologies. Portable filtration unit. 5,069,691, Cl. 55-126.000.
Trivett, Robert L., to Nalco Chemical Company. Solid dry film prelube with low temperature cleanability. 5,069,806, Cl. 252-52.00A.
Trnka, John T.: *See*—
Block, Timothy R.; Ebler, Marcia B.; Freitag, Ladd W.; Heiling, Gerald M.; Holter, Spencer C.; Karst, Dennis L.; Siljenberg, David W.; Soderstrom, Ronald L.; and Trnka, John T., 5,069,522, Cl. 385-39.000.
Troponwerke GmbH & Co.: *See*—
Traber, Jorg; and Bielenberg, Gerhard-Wilhelm, 5,070,102, Cl. 514-415.000.
Trost, Zvezdana: *See*—
Kovacic, Mateja; Milovac, Jenny; Cvelbar, Polona; Stalc, Anton; Trost, Zvezdana; Kopitar, Zdravko; Kofler, Bojan; Nikolic, Vida; Lampret, Marija; and Lippai, Marija, 5,069,910, Cl. 424-464.000.
Troxell, John F., Jr.: *See*—
Wolff, Robert A.; and Troxell, John F., Jr., 5,069,350, Cl. 211-87.000.
Trudell, Leonard A., to Brigham and Women's Hospital. Circulatory support system. 5,069,661, Cl. 604-4.000.
Trumble, Francis R.: *See*—
Seymour, Colin J.; Steel, Martin C.; and Trumble, Francis R., 5,070,278, Cl. 315-248.000.
TRW Cam Gears Limited: *See*—
Adams, Frederick J., 5,069,301, Cl. 180-143.000.
TRW Repa GmbH: *See*—
Fohl, Artur, 5,069,482, Cl. 280-801.000.
Tryon, James A.: *See*—
Stern, Donald J.; Heaton, Jeff S.; Tryon, James A.; and Barthol-mey, Brett A., 5,069,390, Cl. 239-320.000.
Tsai, Duan-Huey: *See*—
Tsai, Shu-Huey; and Tsai, Duan-Huey, 5,069,468, Cl. 280-278.000.
Tsai, Shu-Huey; and Tsai, Duan-Huey. Collapsible bicycle. 5,069,468, Cl. 280-278.000.
Tse, Samuel W.; Schroeder, George O.; and Iwanami, Teruo, to American National Can Company. Film and blends of polyetheramide block copolymer and ethylene vinyl alcohol. 5,069,955, Cl. 428-213.000.
Tseng, Jeou N.; Hong, Chen S.; and Wu, Jeng S. Socket assembly for electrical plugs. 5,069,630, Cl. 439-137.000.
Tsikoyiannis, John G.: *See*—
Haag, Werner O.; and Tsikoyiannis, John G., 5,069,794, Cl. 210-650.000.
Tsubakimoto Chain Co.: *See*—
Kimura, Akira; Kitao, Nobuo; Yasuda, Hiroshi; Shimomura, Yoshimasa; Isozaki, Kiyoshi; and Nishimura, Hiroshi, 5,069,486, Cl. 285-166.000.
Tsuboniwa, Noriyuki; Urano, Satoshi; and Mizuguchi, Ryuzo, to Nippon Paint Co., Ltd. Novel peroxide monomer and a polymer therefrom. 5,070,167, Cl. 526-301.000.
Tsuchiya, Mitsumasa: *See*—
Higashi, Tatsuji; Tsuchiya, Mitsumasa; and Kita, Nobuyuki, 5,069,999, Cl. 430-272.000.
Tsuchiya, Yasuyuki: *See*—
Sakamoto, Hiroyuki; Tobinaga, Kenshiro; and Tsuchiya, Yasuyuki, 5,070,120, Cl. 523-412.000.
Tsuchiya, Yoshiro, to Canon Kabushiki Kaisha. Image forming apparatus featuring a constant contact-pressure drive. 5,070,366, Cl. 355-219.000.
Tsuji, Kazutaka: *See*—
Kikawa, Takeshi; Tsuji, Kazutaka; Sameshima, Kenji; Hirai, Tadaaki; Yamazaki, Junichi; Kubota, Misao; and Shidara, Keiichi, 5,070,272, Cl. 313-386.000.
Tsuji, Sadaaki: *See*—
Aoki, Akira; Fujishima, Yukio; Makio, Yusuke; Kusakawa, Susumu; Tsuji, Sadaaki; and Okamura, Tadashi, 5,069,815, Cl. 252-301.360.
Tsuji, Syoichi: *See*—
Saruwatari, Masumi; Tsuji, Syoichi; and Fujii, Yasuhiro, 5,069,848, Cl. 264-118.000.
Tsukahara, Kengo: *See*—
Saito, Masao; Tsukahara, Kengo; Takahashi, Noriko; and Onda, Yuzi, 5,070,059, Cl. 502-206.000.
Tsukahara, Yutaka: *See*—
Nobumoto, Kazutoshi; Tsuyama, Toshiaki; Onaka, Toru; and Tsukahara, Yutaka, 5,070,461, Cl. 364-426.030.
Tsukamoto, Hirokazu; and Watanabe, Seishi, to Yamaha Hatsudoki Kabushiki Kaisha. Apparatus and method for surface treatment of workpieces. 5,069,760, Cl. 205-80.000.
Tsukamoto, Kazumasa: *See*—
Taniguchi, Takao; Tsukamoto, Kazumasa; Hayabuchi, Masahiro; and Noda, Koji, 5,069,657, Cl. 475-283.000.
Tsumura, Hiroshi; Mutoh, Kiyoyuki; Satoh, Kazushi; and Isobe, Kenichi, to Shin-Etsu Chemical Co., Ltd. Method for the preparation of an organopolysiloxane containing tetrafunctional siloxane units. 5,070,175, Cl. 528-12.000.
Tsunashima, Yoshitaka: *See*—
Miyazaki, Shinji; and Tsunashima, Yoshitaka, 5,069,244, Cl. 137-209.000.
Tsunoda, Masaki: *See*—
Ohyama, Koji; and Tsunoda, Masaki, 5,069,875, Cl. 420-548.000.
Tsurumi, Hiroshi: *See*—
Shinohara, Tohru; and Tsurumi, Hiroshi, 5,070,420, Cl. 360-75.000.
Tsutsui, Koichi: *See*—
Nakano, Shinji; Ohsugi, Hiroharu; Nakae, Yasuhiko; Tanabe, Hisuki; Takagawa, Ryozo; Eguchi, Yoshio; Tsutsui, Koichi; and Endo, Takeshi, 5,070,161, Cl. 526-193.000.
Tsutsumi, Kenichi: *See*—
Iba, Akio; and Tsutsumi, Kenichi, 5,069,105, Cl. 84-605.000.
Tsutsumi, Teruo, to Kabushiki Kaisha Toshiba. Method and apparatus for reading image information formed on material. 5,070,414, Cl. 358-466.000.
Tsutsumi, Yasuhiro; Yokoya, Yuji; Hara, Yoshimichi; Matsunaga, Eiju; Kawata, Hiroyuki; Fukami, Akira; and Suzuki, Yutaka, to Toyota Jidosha Kabushiki Kaisha; and Nippondenso Co., Ltd. Suspension control system. 5,069,476, Cl. 280-707.000.
Tsuyama, Toshiaki: *See*—
Nobumoto, Kazutoshi; Tsuyama, Toshiaki; Onaka, Toru; and Tsukahara, Yutaka, 5,070,461, Cl. 364-426.030.
Tuma, George B.; Tuma, Wade B.; and Warne, Robert E., to Disk Emulation Systems, Inc. Disk emulation system. 5,070,474, Cl. 395-500.000.
Tuma, Wade B.: *See*—
Tuma, George B.; Tuma, Wade B.; and Warne, Robert E., 5,070,474, Cl. 395-500.000.
Turvey, David E.: *See*—
Wills, Leslie J.; and Turvey, David E., 5,070,341, Cl. 346-1.100.
Tuttle, Mark E.: *See*—
Cathey, David A.; Tuttle, Mark E.; Lee, Ruojia; and Lowrey, Tyler A., 5,069,747, Cl. 156-643.000.
Ube Industries Ltd.: *See*—
Yoshimoto, Hataaki; and Ito, Katsuhiro, 5,070,326, Cl. 340-719.000.
Uchida, Tomoaki: *See*—
Kitaura, Masahiro; and Uchida, Tomoaki, 5,070,395, Cl. 358-11.000.
Uchida, Yoshihiro: *See*—
Kakuma, Satoshi; Takahashi, Atsuhisa; and Uchida, Yoshihiro, 5,070,498, Cl. 370-60.000.
UCO, Inc.: *See*—
Blake, Jimmy H.; and Blake, Carl R., 5,069,573, Cl. 403-191.000.
Ueda, Akihiko: *See*—
Ohmori, Akira; Inukai, Hiroshi; Kitahara, Takahiro; and Ueda, Akihiko, 5,069,941, Cl. 427-385.500.
Ueda, Katsunori: *See*—
Togai, Kazuhide; Danno, Yoshiaki; Yoshida, Masato; Shimada, Makoto; and Ueda, Katsunori, 5,069,181, Cl. 123-399.000.

Ueda, Kunihiro: *See*—
Yokoyama, Kenji; Nakayama, Masatoshi; Shimozawa, Toru; Ueda, Kunihiro; and Maruta, Fumio, 5,069,967, Cl. 428-336.000.
Ueda, Michio: *See*—
Okumura, Takashi; Yamaguchi, Koshiro; and Ueda, Michio, 5,070,342, Cl. 346-76.0PH.
Uematsu, Hiroshi: *See*—
Kawajiri, Ryoichi; Uematsu, Hiroshi; and Kato, Takahisa, 5,069,372, Cl. 222-541.000.
Uentech Corporation: *See*—
Bridges, Jack E.; Bajzek, Thomas J.; Hofer, Kenneth E.; Spencer, Homer L.; Smith, Larry G.; and Young, Vincent R., 5,070,533, Cl. 392-301.000.
Uesugi, Takashi: *See*—
Tokiai, Takeo; and Uesugi, Takashi, 5,069,868, Cl. 419-23.000.
Uetani, Yoshio; Ozeki, Tomotaka; and Ishida, Kazuo, to Hitachi Maxell, Ltd. Alkaline cell. 5,069,989, Cl. 429-164.000.
Ulick, Thomas J.; and Carner, William E., to Rubber Waste, Inc. Recovery of hydrocrabon products from elastomers. 5,070,109, Cl. 521-41.000.
Umlauf, Norbert. Stand for exerting a forward or rearward drag on strips. 5,069,427, Cl. 266-104.000.
Uni-Charm Corporation: *See*—
Yamamoto, Masamitsu; Kimura, Noriyuki; Fujioka, Yoshihisa; Yamamoto, Hiroki; and Suekane, Makoto, 5,069,678, Cl. 604-385.100.
Union Carbide Chemicals and Plastics Technology Corporation: *See*—
Cann, Kevin J.; Karol, Frederick J.; and Marcinkowsky, Arthur E., 5,070,057, Cl. 502-119.000.
Grabowski, Wojciech, 5,070,112, Cl. 521-112.000.
Schramm, Kathleen D.; and Karol, Frederick J., 5,070,055, Cl. 502-107.000.
Union Carbide Industrial Gases Technology Corporation: *See*—
Cheung, Harry; Couche, Michael R.; and Dray, James R., 5,069,698, Cl. 62-22.000.
Union Connector Co., Inc.: *See*—
Skirpan, Stephen J., 5,070,429, Cl. 361-358.000.
Union Oil Company of California: *See*—
Allen, William C.; Pye, Stephen D.; Hamblin, Gerald M.; Perez, Jose M.; Amend, William E.; Bush, John D.; Holligan, David; and Pyle, Delbert E., 5,069,485, Cl. 285-55.000.
Harbolt, Bruce A.; and Murata, Perry L., 5,069,352, Cl. 220-1.500.
Uniroyal Chemical Company, Inc.: *See*—
Chin, James; Marshall, James B.; Drozdick, Michael D.; Rosa, Fred C.; and Judge, Fraderick D., 5,070,197, Cl. 544-11.000.
Dekeyser, Mark A.; and Blem, Allen R., 5,070,211, Cl. 549-378.000.
Uniroyal Chemical Ltd./Lte.: *See*—
Dekeyser, Mark A.; and Blem, Allen R., 5,070,211, Cl. 549-378.000.
Unisys Coporation: *See*—
Latif, Farrukh A.; and Stevens, Michael D., 5,070,477, Cl. 395-325.000.
Unisys Corp.: *See*—
Gloski, David, 5,070,423, Cl. 360-106.000.
Lazzarotti, S. James; Wojtowicz, Edward A.; Mullin, Eugene T.; and Nadel, Jess, 5,069,440, Cl. 271-202.000.
United States of America
Administrator, National & Space Administration: *See*—
Abrams, Eve M., 5,068,951, Cl. 29-110.500.
Agriculture: *See*—
Sell, Charles R.; and Weiss, Mark A., 5,069,061, Cl. 73-19.010.
Air Force: *See*—
Milberger, Walter E.; Kerfoot, Charles S.; and Jones, Franklin B., 5,070,538, Cl. 455-126.000.
Pinkus, Alan R., 5,070,239, Cl. 250-252.100.
Salib, Mike L.; and Cohn, Marvin, 5,070,304, Cl. 330-54.000.
Army: *See*—
Bartram, Philip W.; DiBona, Noel C.; Buchanan, James H.; and Rohrbaugh, Dennis K., 5,069,797, Cl. 210-690.000.
Sillery, Ruth C., 5,068,968, Cl. 33-233.000.
Energy: *See*—
Bissett, Larry A.; and Strickland, Larry D., 5,069,685, Cl. 48-77.000.
Health and Human Services: *See*—
Hoofnagle, Jay H.; Broder, Samuel; Mitsuya, Hiroaki; and Yarchoan, Robert, 5,070,077, Cl. 514-45.000.
Interior: *See*—
Murphy, Andrew P., 5,069,800, Cl. 210-757.000.
Navy: *See*—
Desrosiers, Michael R., 5,069,096, Cl. 82-151.000.
U.S. Philips Corporation: *See*—
Summers, Christopher P., 5,070,254, Cl. 307-261.000.
van den Bogert, Willem J.; Roozekrans, Christianus J.; and Wanninkhof, Markus W. M., 5,070,273, Cl. 313-607.000.
Van Gorkum, Aart A., 5,070,387, Cl. 357-60.000.
United Technologies Corporation: *See*—
Dyer, Gerald P.; and Donnelly, Brian G., 5,069,251, Cl. 137-625.250.
McBrien, Gregory J.; Martin, Anthony N.; and Modeen, Douglas P., 5,069,071, Cl. 73-654.000.
Universal Cooperatives, Inc.: *See*—
Wiwi, Mark A., 5,069,164, Cl. 119-53.000.
University of Akron: *See*—
Isayev, Avraam I.; and Subramania, Pazampalaco R., 5,070,157, Cl. 525-444.000.
University of Birmingham, The: *See*—
Harris, Ivor R.; and Safi, Syed H., 5,069,713, Cl. 75-232.000.
University of British Columbia: *See*—
Liang, Dong C.; and Blades, Michael W., 5,069,546, Cl. 356-316.000.
University of California: *See*—
Petrovic, John J.; Honnell, Richard E.; and Gibbs, W. Scott, 5,069,841, Cl. 264-86.000.
University of Colorado Foundation, Inc.: *See*—
Pankove, Jacques I., 5,070,040, Cl. 437-209.000.
University of Manchester Institute of Science & Technology: *See*—
Hladky, Karel; and John, David G., 5,069,774, Cl. 204-404.000.
University of Minnesota, Regents of the: *See*—
Reid, Kenneth J., 5,069,715, Cl. 75-414.000.
University of Pennsylvania, Trustees of the: *See*—
Margolis, David J., 5,070,108, Cl. 514-725.000.
University of Sydney, The: *See*—
Simpson, Stephen W., 5,070,244, Cl. 250-343.000.
Uno-A-Erre Italia S.r.l.: *See*—
Fornaini, Domenico, 5,069,028, Cl. 59-80.000.
Uosaki, Youichi: *See*—
Kanda, Yutaka; Uosaki, Youichi; Saito, Hiromitsu; Sano, Hiroshi; Kobayashi, Eiji; Morimoto, Makoto; and Nagamura, Satoru, 5,070,092, Cl. 514-253.000.
UPAT GmbH & Company: *See*—
Kistner, Herbert; and Weber, Christian, 5,069,581, Cl. 405-259.600.
Urano, Satoshi: *See*—
Tsuboniwa, Noriyuki; Urano, Satoshi; and Mizuguchi, Ryuzo, 5,070,167, Cl. 526-301.000.
Urban, Carl T.; and Gahan, James B., to Eastman Kodak Company. Paper tray support and paper feed for reproduction apparatus. 5,069,438, Cl. 271-10.000.
Urso, Tina, to Figgie International, Inc. Quick-donning head harness assembly. 5,069,205, Cl. 128-201.240.
Urushidani, Haruo: *See*—
Kuroda, Michio; Kirikami, Seiichi; Hisano, Katsukuni; Iizuka, Nobuyuki; Urushidani, Haruo; Sato, Isao; Ishibashi, Yoji; and Ohmori, Takashi, 5,069,029, Cl. 60-39.060.
Ushioda, Shunta: *See*—
Ohneda, Noboru; Ushioda, Shunta; Arima, Haruo; Hashimoto, Ichiro; Kaneko, Denziro; and Sugiyama, Kazuo, 5,069,055, Cl. 72-283.000.
Ohneda, Noboru; Ushioda, Shunta; Arima, Haruo; Hashimoto, Ichiro; Kaneko, Denziro; Sugiyama, Kazuo; Fukazawa, Tsuguo; Tachi, Teruo; and Mukasa, Takashi, 5,069,095, Cl. 82-124.000.
USX Corporation: *See*—
Modrowski, Thomas A.; Pfister, Larry E.; Raybuck, Gregory A.; and Stoddart, James O., 5,069,762, Cl. 205-137.000.
UTI Corporation: *See*—
Decker, Frank, 5,070,314, Cl. 333-260.000.
Utsugi, Nobuo: *See*—
Kitazawa, Hideki; Terada, Ryohei; Takeuchi, Shogo; Kayama, Tsutomu; Tanimoto, Kohichi; Utsugi, Nobuo; and Nagai, Yoshiaki, 5,070,431, Cl. 362-31.000.
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Fukuda, Yujiro; Utsumi, Shigeo; and Suzuki, Shinobu, 5,070,180, Cl. 528-272.000.
Utsunomiya, Yoichi: *See*—
Ito, Masazumi; and Utsunomiya, Yoichi, 5,070,363, Cl. 355-206.000.
Valde, Giuseppe, to Gulardini S.p.A. Airtight joining element between an external container and a supporting element for an external rear-view mirror assembly for a vehicle. 5,069,539, Cl. 359-514.000.
Valka, William A.: *See*—
Short, David E.; Ahlstone, Arthur G.; and Valka, William A., 5,069,287, Cl. 166-339.000.
Valmet Oy: *See*—
Panttila, Vaino ; and Villgren, Voitto, 5,069,394, Cl. 242-67.10R.
Valor Incorporated: *See*—
Thow, Ian; and Gupta, Ajay K., 5,069,200, Cl. 126-512.000.
Van den Bergh Foods Co., Division of Conopco, Inc.: *See*—
Devitt, Michael T.; and Weyland, Mark, 5,069,915, Cl. 426-93.000.
Van Dalen, Josef P.; and Brunia, Leo, 5,069,829, Cl. 260-428.000.
Van Voskuilen-Woudenberg B.V.: *See*—
Nielsen, Anders G., 5,069,234, Cl. 134-113.000.
Van Allman, Don T.: *See*—
Ernst, Richard J.; Van Allman, Don T.; Gupta, Harish C.; Dill, Michael C.; and Nilsen, Martin J., 5,069,340, Cl. 206-347.000.
Vanaschen, Luc: *See*—
d'Iribarne, Benoit; Kuster, Hans-Werner; and Vanaschen, Luc, 5,069,703, Cl. 65-104.000.
Van Dalen, Josef P.; and Brunia, Leo, to Van den Bergh Foods Co., Division of Conopco, Inc. Process for refining glyceride oil using silica hydrogel. 5,069,829, Cl. 260-428.000.
van den Bogert, Willem J.; Roozekrans, Christianus J.; and Wanninkhof, Markus W. M., to U.S. Philips Corporation. Low-pressure mercury vapor discharge lamp with flat discharge vessel and external side electrodes. 5,070,273, Cl. 313-607.000.
Van der Aa, Marcel J. M.: *See*—
Stokbroekx, Raymond A.; and Van der Aa, Marcel J. M., 5,070,090, Cl. 514-236.500.
Vanderbilt, Jeffrey J.; and Neeley, Charles M., to Eastman Kodak Company. Environmentally degradable polymer blends. 5,070,122, Cl. 524-47.000.
Van Der Eijk, Johan M.: *See*—
Biswas, Jaydeep; Maxwell, Ian E.; and Van Der Eijk, Johan M., 5,069,776, Cl. 208-120.000.

Van Der Linden, James A.; and Van Der Linden, John J., to Van Der Linden, James A.; and Van Der Linden, John J. Travel and utility trailer combination. 5,069,471, Cl. 280-414.100.

Van Der Linden, John J.: *See*—
Van Der Linden, James A.; and Van Der Linden, John J., 5,069,471, Cl. 280-414.100.

Vandermark, Keaton D., to Befco, Inc. Gang mower apparatus. 5,069,022, Cl. 56-6.000.

Vandermeersch, Edmond, to S.A.R.L. "Matiba-Manufactures de Tissus". Fire resistant elastic strap. 5,069,957, Cl. 428-230.000.

Vandervoort, John R., to Eaton Corporation. Self-energizing synchronizer. 5,069,079, Cl. 74-339.000.

Van Dyke, Robert E.: *See*—
Abrams, John S.; and Van Dyke, Robert E., 5,070,013, Cl. 435-7.500.

Van Gorkum, Aart A., to U.S. Philips Corp. Semiconductor device comprising unidimensional doping conductors and method of manufacturing such a semiconductor device. 5,070,387, Cl. 357-60.000.

Van Maanan, Alfons: *See*—
Kennedy, David; Mussett, Gerard; Van Maanan, Alfons; and Smetham, James N., 5,069,131, Cl. 102-275.600.

Vanover, Joel L.; Boyer, Jon F.; Hohlbein, Douglas J.; Montalbano, Anthony P.; Montalbano, Christopher P.; and Van Remoortel, John G., to Du Pont de Nemours, E. I., and Company. Method and apparatus for processing photosensitive material. 5,070,351, Cl. 354-299.000.

Van Remoortel, John G.: *See*—
Vanover, Joel L.; Boyer, Jon F.; Hohlbein, Douglas J.; Montalbano, Anthony P.; Montalbano, Christopher P.; and Van Remoortel, John G., 5,070,351, Cl. 354-299.000.

Van Tuttle, Joel: *See*—
Selway, John W. T.; Beacham, Lowrie M., III; Daluge, Susan M.; Van Tuttle, Joel; and Krenitsky, Thomas A., 5,070,078, Cl. 514-50.000.

Vanvoren, Claude; Coste, Benoit; and Keime, Francois, to Aluminum Pechiney. Process of shaping carbonaceous blocks by multiaxial compacting. 5,069,842, Cl. 264-101.000.

VanWeelden, Marvin H.; and VanWeelden, Susan V. Protection device for a manual slack adjuster. 5,069,315, Cl. 188-79.550.

VanWeelden, Susan V.: *See*—
VanWeelden, Marvin H.; and VanWeelden, Susan V., 5,069,315, Cl. 188-79.550.

Vanysacker, Yves, to Amchim S.A. Process for improving the organoleptic properties of wines. 5,068,998, Cl. 47-58.000.

Van Zanten, Anton; Ruf, Wolf-Dieter; Kost, Friedrich; and Weiss, Karl-Josef, to Robert Bosch GmbH. Anti-blocking and/or wheel slip regulating system. 5,070,459, Cl. 364-426.020.

Varenchuk, Pavel A.: *See*—
Paton, Boris E.; Podgaetsky, Vladimir V.; Varenchuk, Pavel A.; Privalov, Nikolai T.; Galinich, Vladimir I.; Kovalev, Valentin D.; and Romanenko, Yaroslav A., 5,070,225, Cl. 219-73.000.

Vargus, Joel T.: *See*—
Weinerman, Lee S.; and Vargus, Joel T., 5,069,491, Cl. 292-48.000.

VEB Agrochemie Piesteritz: *See*—
Bendix, Horst; Hochmuth, Bernd; Johannes, Dieter; Lakenmacher, Bodo; Lausch, Winfried; and Schuebel, Klaus, 5,069,891, Cl. 423-359.000.

Veldboer, Werner: *See*—
Sodec, Franc; and Veldboer, Werner, 5,069,114, Cl. 454-297.000.

Velezis, George A.; and Mossberg, Alan I. Forearm assembly. 5,068,992, Cl. 42-72.000.

Verhelst, Gabriel: *See*—
Watts, Arun; Muller, Louis; Verhelst, Gabriel; De Witte, Mireille; Pham, Tu; and Parfondry, Alain, 5,070,114, Cl. 521-159.000.

Vershure, Roy W., Jr.: *See*—
Shekleton, Jack R.; Vershure, Roy W., Jr.; and Smith, Robert W., 5,069,031, Cl. 60-39.120.

Versic, Ronald J. Moldable microcapsule that contains a high percentage of solid core material, and method of manufacture thereof. 5,069,972, Cl. 428-407.000.

Vesin, Gerard: *See*—
Seng, Gert; and Vesin, Gerard, 5,069,082, Cl. 74-523.000.

Vesuvius Crucible Company: *See*—
Phillippi, R. Michael, 5,069,553, Cl. 374-140.000.

Vetter, Helmut; and Geprags, Peter, to Arzneimittel GmbH Apotheker Vetter & Co. Hypodermic syringe. 5,069,670, Cl. 604-243.000.

Vetter, William L.; and Mortensen, Dennis L., to Bold Plastics, Inc. Apparatus for cleaning and rinsing wafers. 5,069,235, Cl. 134-113.000.

Victor Company of Japan, Ltd.: *See*—
Kitaura, Masahiro; and Uchida, Tomoaki, 5,070,395, Cl. 358-11.000.
Kobayashi, Kaoru, 5,070,394, Cl. 358-11.000.

Villgren, Voitto: *See*—
Panttila, Vaino ; and Villgren, Voitto, 5,069,394, Cl. 242-67.10R.

Vinke, Johannes: *See*—
Dersch, Rolf; Dehne, Heinrich; Gellert, Roland; Mueller, Dietrich-Wolfgang; Vinke, Johannes; and Wistuba, Eckehardt, 5,070,136, Cl. 524-555.000.

Visser, Anthony, to Visser 's-Gravendeel Holding B.V. Apparatus and method for planting out plants. 5,068,999, Cl. 47-73.000.

Visser 's-Gravendeel Holding B.V.: *See*—
Visser, Anthony, 5,068,999, Cl. 47-73.000.

VLSI Technology, Inc.: *See*—
Ta, Paul D., 5,070,307, Cl. 330-253.000.

Voest-Alpine Industrieanlagenbau G.m.b.H.: *See*—
Auberger, Heinrich; and Muller, Heinz, 5,069,429, Cl. 266-143.000.

Vogelsang, Horst, to Dipl. -Ing. Dr. Ernst Vogelsang GmbH & Co. KG. Conduit assembly for cabling. 5,069,254, Cl. 138-111.000.

Vogt, Rainer: *See*—
Normoyle, Kevin B.; Guyer, James M.; Vogt, Rainer; and Fong, Anthony S., 5,070,475, Cl. 395-375.000.

Von Burg, Gregory F.: *See*—
Schiehser, Guy A.; and Von Burg, Gregory F., 5,070,207, Cl. 548-208.000.

von Rolbicki, Wolfgang: *See*—
Amthor, Thomas; Neumann, Erwin; von Rolbicki, Wolfgang; and Starke Frank, 5,069,505, Cl. 297-216.000.

Voss, Frands W.: *See*—
Hansen, Henning M.; and Voss, Frands W., 5,069,075, Cl. 73-861.380.

Vrettos, Socrates. Windshield wiper assembly. 5,068,942, Cl. 15-250.240.

Vuachet, Michel; and Huet, Jean-Marie, to Atochem. Snow ski soles. 5,069,976, Cl. 428-474.400.

W. A. Whitney Corp.: *See*—
Fulton, Wayne L., 5,069,099, Cl. 83-468.600.

W.C. Heraeus GmbH: *See*—
Blanke, Inge; Burckhardt, Hans-Georg; Gora, Frieder; Guldner, Karlheinz; Dehoust, Jurgen; Modes, Christina; Kemmler-Sack, Sybille; and Schmidt, Joachim, 5,069,824, Cl. 252-518.000.

W. R. Grace & Co.-Conn.: *See*—
Block, Jacob; Tessier, Noel J.; and Colageo, Anthony J., 5,069,702, Cl. 65-21.400.
Hwa, Chih M.; Kelly, John A.; Neton, Janet; Scanlon, Patricia M.; and Gaudette, Roger R., 5,069,798, Cl. 210-700.000.

Wachendorff-Neumann, Ulrike: *See*—
Fuchs, Rainer; Wachendorff-Neumann, Ulrike; Becker, Benedikt; Erdelen, Christoph; and Stendel, Wilhelm, 5,070,098, Cl. 514-359.000.

Wachs, Fred B., III; and Abbott, Roy W., to Advanced Cooling Technology, Inc. Refrigeration system with evaporative subcooling. 5,069,043, Cl. 62-305.000.

Wada, Hirotaka: *See*—
Ozaki, Tatsuhiko; Wada, Hirotaka; and Sugiura, Fumitoshi, 5,070,147, Cl. 525-285.000.

Wada, Shigeru: *See*—
Inoue, Manabu; Taniguchi, Nobuyuki; Nanba, Katsuyuki; Kudo, Yoshinobu; Iwata, Michihiro; and Wada, Shigeru, 5,070,355, Cl. 354-413.000.

Wade, William R.; and Ports, Kenneth A., to Harris Corporation. Trench-resident interconnect structure. 5,070,388, Cl. 357-68.000.

Wadley Technologies, Inc.: *See*—
Dorn, Gordon L., 5,070,014, Cl. 435-34.000.

WAFIOS Maschinenfabrik GmbH & Co. Kommanditgesellschaft: *See*—
Lange, Gerhard, 5,069,059, Cl. 72-421.000.

Wagner, Edward T., to Westinghouse Electric Corp. Solid state control circuit for a dual battery power supply. 5,070,253, Cl. 307-75.000.

Wagner Foerdertechnik GmbH & Co. Kg: *See*—
Seng, Gert; and Vesin, Gerard, 5,069,082, Cl. 74-523.000.

Wagner, Joachim; Elsner, Thomas; Rasshofer, Werner; Faehndrich, Jurgen; and Jurgens, Eberhard, to Bayer Aktiengesellschaft. Process for the production of molded articles by deep-drawing prefabricated polyurethane(urea) parts or by pressing fragmented polyurethane(urea) material. 5,069,857, Cl. 264-544.000.

Wahl Clipper Corporation: *See*—
Wahl, Gregory S.; and Walton, William M., 5,068,966, Cl. 30-43.920.

Wahl, Gregory S.; and Walton, William M., to Wahl Clipper Corporation. Blade assembly for electric hair clippers. 5,068,966, Cl. 30-43.920.

Wain, Peter L. Method for forming a molding. 5,069,849, Cl. 264-148.000.

Waketa, Hideharu; Suzuki, Yoshiharu; Murakoshi, Motoharu; Kakiuchi, Hideaki; Ohgushi, Masuhito; Watanabe, Kenichi; and Sawai, Toshiya, to Nitto Boseki Co., Ltd.; and Chisso Corporation. Silane coupling agent and glass fiber product for laminates. 5,069,971, Cl. 428-391.000.

Wakimoto, Takeo: *See*—
Nakada, Hitoshi; Wakimoto, Takeo; Shinkai, Masanao; and Matsunaga, Daisaku, 5,069,975, Cl. 428-457.000.

Wakita, Motoji: *See*—
Kako, Mitsumasa; Morita, Toshiki; and Wakita, Motoji, 5,069,564, Cl. 400-605.000.

Walker, Loren H., to General Electric Company. Power conversion scheme employing paralleled units. 5,070,440, Cl. 363-71.000.

Walker, Mark A., to Lennox Industries Inc. Coil bypass arrangement. 5,069,040, Cl. 62-181.000.

Wall, Nicholas J., to Whitford Plastics Limited. Thermal spraying of stainless steel. 5,069,937, Cl. 427-227.000.

Wallis, Bernard J. Method and apparatus for cutting corrugated webs. 5,069,053, Cl. 72-185.000.

Walsh, David A.: *See*—
Teng, Lina C.; Walsh, David A.; and Shanklin, James R., Jr., 5,070,087, Cl. 514-212.000.

Walters, Peter J., to Wilson Sporting Goods Co. Method of making water-repellent leather game ball. 5,069,935, Cl. 427-209.000.

Walton, William M.: *See*—
Wahl, Gregory S.; and Walton, William M., 5,068,966, Cl. 30-43.920.

Wang, Lawrence K.; Wang, Mu H. S.; Hwang, Chong S.; and Rhow, Harold, to Int'l Environmental Systems, Inc.; and Globe Environmental Protection, Inc. Liquid treatment apparatus. 5,069,783, Cl. 210-196.000.

Wang, Mu H. S.: *See*—
Wang, Lawrence K.; Wang, Mu H. S.; Hwang, Chong S.; and Rhow, Harold, 5,069,783, Cl. 210-196.000.

Wang, Shui-Nu. Differential feeding apparatus for a sewing machine. 5,069,152, Cl. 112-313.000.

Wanninkhof, Markus W. M.: *See*—
van den Bogert, Willem J.; Roozekrans, Christianus J.; and Wanninkhof, Markus W. M., 5,070,273, Cl. 313-607.000.

Ward, Bennett C.: *See*—
Alvarez, Edwardo; DiSano, Lorenzo P.; and Ward, Bennett C., 5,070,153, Cl. 525-420.000.

Ward, Thomas A.: *See*—
Nugent, Richard M., Jr.; Ward, Thomas A.; Greigger, Paul D.; and Seiner, Jerome A., 5,070,119, Cl. 523-179.000.

Wardwell, Mary M. Strap device for increasing lung capacity. 5,069,449, Cl. 272-139.000.

Waring, Alfred L.: *See*—
Parsons, Linda M.; Bopp, Lawrence; Waring, Alfred L.; and Shayegani, Mehdi, 5,070,011, Cl. 435-6.000.

Warne, Robert E.: *See*—
Tuma, George B.; Tuma, Wade B.; and Warne, Robert E., 5,070,474, Cl. 395-500.000.

Warner, Charles L., II: *See*—
Szlam, Aleksander; Crooks, James W., Jr.; and Warner, Charles L., II, 5,070,525, Cl. 379-196.000.

Warner-Lambert Company: *See*—
Malone, Thomas C., 5,070,093, Cl. 514-284.000.

Warner, Shawn A.; and Moder, Thomas R., to Motorola, Inc. Method and apparatus for call source identification. 5,070,521, Cl. 379-58.000.

Washington, Nathaniel. Illuminating peg board game. 5,069,458, Cl. 273-238.000.

Washington University: *See*—
Rotwein, Peter S.; and Krivi, Gwen G., 5,070,075, Cl. 514-12.000.

Wasimoto, Takasi; and Kimura, Morio, to Stanley Electric Co., Ltd.; and Alpine Electronics Inc. Miniature bulb assembly and method of producing the same. 5,069,640, Cl. 439-619.000.

Wass, Anthony C. L.: *See*—
Smith, David K.; and Wass, Anthony C. L., 5,069,204, Cl. 128-200.230.

Wasson, Robert C.: *See*—
Braig, Adalbert; Meier, Hans-Rudolf; Leppard, David G.; Wasson, Robert C.; and Phillips, Emyr, 5,069,805, Cl. 252-47.500.

Watababe, Naotaka; Arai, Takao; Fujiyoshi, Hitoshi; and Shirota, Masako, to Mitsui-Cyanamid, Ltd. Papermaking method. 5,069,754, Cl. 162-168.200.

Watanabe, Kenichi: *See*—
Waketa, Hideharu; Suzuki, Yoshiharu; Murakoshi, Motoharu; Kakiuchi, Hideaki; Ohgushi, Masuhito; Watanabe, Kenichi; and Sawai, Toshiya, 5,069,971, Cl. 428-391.000.

Watanabe, Naotaka: *See*—
Tamura, Akira; Watanabe, Naotaka; Fujiyoshi, Hitoshi; and Shirota, Masako, 5,069,721, Cl. 106-724.000.

Watanabe, Nobuatsu; Tojo, Tetsuro; Chong, Yong-bo; and Ikari, Kenji, to Watanabe, Nobuatsu. Carbon electrode having low polarizability. 5,069,764, Cl. 204-60.000.

Watanabe, Seishi: *See*—
Tsukamoto, Hirokazu; and Watanabe, Seishi, 5,069,760, Cl. 205-80.000.

Watanabe, Shinpei; Watanabe, Yasuto; Ikeda, Yuzi; Gunji, Keiichiro; and Niikawa, Ryo, to Honda Giken Kogyo Kabushiki Kaisha. Robot hand optical fiber connector coupling assembly. 5,069,524, Cl. 385-59.000.

Watanabe, Yasuhiko: *See*—
Taniguchi, Naohiro; Koike, Syuzo; Watanabe, Yasuhiko; Takeuchi, Tadao; and Fujiwara, Noboru, 5,069,784, Cl. 210-205.000.

Watanabe, Yasuto: *See*—
Watanabe, Shinpei; Watanabe, Yasuto; Ikeda, Yuzi; Gunji, Keiichiro; and Niikawa, Ryo, 5,069,524, Cl. 385-59.000.

Watanuki, Yoshio: *See*—
Mochida, Haruo; and Watanuki, Yoshio, 5,069,493, Cl. 292-336.300.

Watarai, Syu: *See*—
Tachikawa, Hiromichi; Yokoya, Hiroaki; Watarai, Syu; and Aoai, Toshiaki, 5,069,992, Cl. 430-49.000.

Waters, Gregory M.: *See*—
Hawe, William R.; Tardo, Joseph J.; Kaufman, Charles W.; Gupta, Amar; Spinney, Barry A.; and Waters, Gregory M., 5,070,528, Cl. 380-48.000.

Wathen, Ronald L.: *See*—
Miller, Steven L.; Wathen, Ronald L.; and Palazzo, Raymond E., Jr., 5,069,785, Cl. 210-232.000.

Watson, Edwin G., to General Electric Company. Magneto-optic media recording system including a directed magnetic bias flux. 5,070,487, Cl. 369-13.000.

Watts, Arun; Muller, Louis; Verhelst, Gabriel; De Witte, Mireille; Pham, Tu; and Parfondry, Alain, to Imperial Chemical Industries PLC. Isocyanate composition and process for making flexible foams therefrom. 5,070,114, Cl. 521-159.000.

Way, James A.: *See*—
Marquez, Al H.; Way, James A.; and Remelman, G. Mark, 5,069,116, Cl. 99-330.000.

Wear, Philip A.; and Wear, Stuart C. W. Display rack structure. 5,069,349, Cl. 211-59.300.

Wear, Stuart C. W.: *See*—
Wear, Philip A.; and Wear, Stuart C. W., 5,069,349, Cl. 211-59.300.

Webasto AG Fahrzeugtechnik: *See*—
Reihl, Peter; Fuerst, Arpad; Wingen, Bernhard; Schmid, Alfred; Schreiter, Thomas; and Haendler, Erich, 5,069,500, Cl. 296-214.000.

Weber, Christian: *See*—
Kistner, Herbert; and Weber, Christian, 5,069,581, Cl. 405-259.600.

Weber, Edwin, to Kautt & Bux KG. Switch device. 5,070,221, Cl. 200-284.000.

Weber-Stephen Products Co.: *See*—
Schlosser, Erich J.; and Alden, J. Michael, 5,069,196, Cl. 126-25.00R.

Weckstrom, Kurt P.: *See*—
Rantala, Borje T.; and Weckstrom, Kurt P., 5,070,245, Cl. 250-343.000.

Wedder[illegible]urn-Bisshop, Thomas, to Rank Cintel Limited. Keying methods for digital video. 5,070,397, Cl. 358-22.000.

Wehling, Klaus: *See*—
Fossati, Piero; Heidenreich, Holger; Hugl, Herbert; and Wehling, Klaus, 5,070,198, Cl. 544-182.000.

Wehowsky, Frank: *See*—
Gitzel, Jorg; Macholdt, Hans-Tobias; Sieber, Alexander; Wehowsky, Frank; and Prossel, Gunther, 5,069,994, Cl. 430-110.000.

Wehr, C. Timothy: *See*—
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Weibel, A. Thomas, to FMC Corporation. Process for bleaching/sanitizing food fiber. 5,069,919, Cl. 426-261.000.

Weiner, Robert I. Edge retainer for a floating pool cover. 5,068,929, Cl. 4-503.000.

Weinerman, Lee S.; and Vargus, Joel T., to Eastern Company, The. Vehicle door lock system. 5,069,491, Cl. 292-48.000.

Weiss, Karl-Josef: *See*—
Van Zanten, Anton; Ruf, Wolf-Dieter; Kost, Friedrich; and Weiss, Karl-Josef, 5,070,459, Cl. 364-426.020.

Weiss, Mark A.: *See*—
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Welch Allyn, Inc.: *See*—
Salvati, Jon R.; and Lia, Raymond A., 5,070,401, Cl. 358-107.000.

Welch, Dennis E.: *See*—
Thielman, David E.; Welch, Dennis E.; and Bezat, Theodore P., 5,069,041, Cl. 62-263.000.

Weller, Harvey G. Illuminated scenic glass. 5,070,435, Cl. 362-101.000.

Wells, Alan A., to Haser Company Limited, The. Pressure swing gas separation. 5,069,688, Cl. 55-25.000.

Welply, Joseph K., to Monsanto Company. Method of modifying oligosaccharide structure of tissue plasminogen activator. 5,070,021, Cl. 435-226.000.

Welte, Rainer; and Scholl, Hans-Joachim, to Bayer Aktiengesellschaft. Substantially closed-cell rigid foams containing urethane, urea and biuret groups and a process for their production. 5,070,115, Cl. 521-173.000.

Wenrick, Jarod D., to Creative Extruded Products, Inc. Apparatus and method for applying coating material. 5,069,940, Cl. 427-284.000.

Wenz, Otto D., Jr. Drill chuck key bearings. 5,069,585, Cl. 408-241.00R.

Wenzel, Dieter: *See*—
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Werner, Frank D.; and Greig, Richard C., to Werner, Frank D. Method of repairing windshield breaks. 5,069,836, Cl. 264-36.000.

West, Guy J.: *See*—
Mahany, Ronald L.; Sojka, Marvin L.; and West, Guy J., 5,070,536, Cl. 455-67.000.

Westates Carbon: *See*—
Goldhaar, Abraham, 5,069,689, Cl. 55-61.000.

Westberg, Tom; and Mattiazzi, Joseph A., to Outboard Marine Corporation. Molded lower motor cover. 5,069,643, Cl. 440-77.000.

Western Company of North America, The: *See*—
Mack, David J., 5,069,283, Cl. 166-308.000.

Western Digital Corporation: *See*—
Patterson, Timothy P.; Hoge, Carl E.; and Baia, Joseph, 5,069,626, Cl. 439-55.000.

Western Publishing Company, Inc.: *See*—
Jeffway, Robert W., Jr.; and Dobosz, Catherine R., 5,069,361, Cl. 221-82.000.

Westinghouse Air Brake Company: *See*—
Kanjo, Wajih; Krampitz, Mark S.; and Moriarity, Michael J., 5,069,312, Cl. 188-52.000.

Westinghouse Electric Corp.: *See*—
Meuschke, Robert E.; Harper, Mark J.; and Stefko, David J., 5,069,863, Cl. 376-270.000.
Przybysz, John X., 5,069,748, Cl. 156-643.000.
Shirey, Ray A.; and Murray, David E., 5,069,172, Cl. 122-382.000.
Wagner, Edward T., 5,070,253, Cl. 307-75.000.
Yeo, Denis; and Boatwright, David A., 5,069,865, Cl. 376-451.000.

Westphalen, Karl-Otto; Hamprecht, Gerhard; Wuerzer, Bruno; and Meyer, Norbert, to BASF Aktiengesellschaft. N-((6-trifluoromethylpyrimidin-2-yl)-aminocarbonyl)-2-carboalkoxybenzenesulfonamides. 5,069,710, Cl. 71-92.000.

Westphalen, Karl-Otto: *See*—
Meyer, Norbert; Shirmer, Ulrich; Plath, Peter; Wuerzer, Bruno; and Westphalen, Karl-Otto, 5,069,708, Cl. 71-90.000.

Wetzel, Thomas J.: *See*—
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Wheeler, David C.: *See*—
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Wheeler, Ernest E.; Wheeler, William M.; Wheeler, David C.; and Henderson, Thomas D. Filter changing mechanism for a video camera. 5,070,407, Cl. 358-225.000.

Wheeler, William M.: *See*—
Wheeler, Ernest E.; Wheeler, William M.; Wheeler, David C.; and Henderson, Thomas D., 5,070,407, Cl. 358-225.000.

Whirlpool Corporation: *See*—
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Whitbourne, Richard J.; and Mangan, Margaret A., to Sterilization Technical Services, Inc. Anti-thrombogenic, anti-microbial compositions containing heparin. 5,069,899, Cl. 424-56.000.

White, John A., to Bicron Corporation. Photomultiplier tube mounting for well logging detectors. 5,070,249, Cl. 250-483.100.

White, Raymond F.: *See*—
Petuch, Brian R.; Chen, Shieh-Shung T.; Inamine, Edward S.; and White, Raymond F., 5,070,015, Cl. 435-42.000.

White, Robert C., to Sundstrand Corporation. Gas turbine ignition system. 5,069,032, Cl. 60-39.141.

Whitford Plastics Limited: *See*—
Wall, Nicholas J., 5,069,937, Cl. 427-227.000.

Wiblin, Claude M., to Radon Testing Corporation of America. Collapsible detector for short and long term measurements of radon gas. 5,070,247, Cl. 250-472.100.

Wieland, Roy M., to R. M. Wieland Company. Knock-down furniture assembly. 5,069,506, Cl. 297-440.000.

Wiggermann, Peter: *See*—
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Wijmans, Johannes G.: *See*—
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Wilke, Detlef: *See*—
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Wilkes, Gene W. Combined floor sink and strainer. 5,069,781, Cl. 210-164.000.

Wilkin, Arthur L.: *See*—
Street, Michael J.; Benson, John A.; Marchant, John A.; Wilkin, Arthur L.; and Allen, Clive J., 5,069,160, Cl. 119-14.080.

Wilkinson, James H., to Sony Corporation. Video signal interpolation. 5,070,403, Cl. 358-136.000.

Wilkinson, William T. Device for simulating climbing. 5,069,444, Cl. 272-70.000.

William H. Kaufman Inc.: *See*—
Kaufman, William H.; Harrison, Frederick A.; Gidman, Claude J.; and Beekenkamp, Gerald, 5,068,984, Cl. 36-117.000.

Williams, Andy C. Mounting bracket for communication related devices. 5,069,407, Cl. 248-221.300.

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Williams, Danny R.; and Barron, Mary A., to Houston Industries Incorporated. Insulator climbing support. 5,069,310, Cl. 182-187.000.

Williams, Della H.; Williams, Robert A.; Herron, Jeffrey W.; and Britt, Karen M., to Williams Instruments, Inc. Jewelry box. 5,069,332, Cl. 206-6.100.

Williams, George A.: *See*—
Swets, Mark D.; Williams, George A.; and Goodman, Steven F., 5,069,511, Cl. 312-107.500.

Williams Instruments, Inc.: *See*—
Williams, Della H.; Williams, Robert A.; Herron, Jeffrey W.; and Britt, Karen M., 5,069,332, Cl. 206-6.100.

Williams, John N.: *See*—
Stein, Jay A.; Plewes, Donald B.; Gershman, Russell J.; Liebau, James G.; and Williams, John N., 5,070,519, Cl. 378-146.000.

Williams, Robert A.: *See*—
Williams, Della H.; Williams, Robert A.; Herron, Jeffrey W.; and Britt, Karen M., 5,069,332, Cl. 206-6.100.

Williams, Ronald D.; and Crow, William D., to Emerson Electric Co. Compressed spacer for permanent retention of electrical motor terminals. 5,070,265, Cl. 310-71.000.

Williamson, Nina J.; Bingham, Dawn L.; and Bauman, Mary B. Elasticized stocking removal system. 5,069,374, Cl. 223-111.000.

Williford, Jeffrey M. Folding funiture. 5,069,144, Cl. 108-129.000.

Willms, Lothar: *See*—
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Wills, Leslie J.; and Turvey, David E., to Commonwealth Scientific and Industrial Research Organisation. Liquid stream deflection printing method and apparatus. 5,070,341, Cl. 346-1.100.

Wilson, John C.; and Alexandrovich, Peter S., to Eastman Kodak Company. N,N'-substitutedbis(pyridinium) salts. 5,070,203, Cl. 546-13.000.

Wilson Sporting Goods Co.: *See*—
Walters, Peter J., 5,069,935, Cl. 427-209.000.

Wingen, Bernhard: *See*—
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Winter, William E., Jr.: *See*—
Culross, Claude C.; Stuntz, Gordon F.; and Winter, William E., Jr., 5,070,053, Cl. 502-64.000.

Wippler, Heather; and Nolet, Leopole. Reusable diaper. 5,069,672, Cl. 604-385.100.

Wireman, Daniel R.: *See*—
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Wireman, Jack; and Wireman, Daniel R., to Blaw Knox Food & Chemical Equipment Company. Apparatus for conditioning particulate material. 5,068,979, Cl. 34-58.000.

Wisconsin Alumni Research Foundation: *See*—
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Wise, James J.; and Doherty, John A. Synchronized granular material and liquid spreading device with full hydraulic control. 5,069,392, Cl. 239-675.000.

Wiseman, Gary H.: *See*—
Dupon, Ryan W.; Thompson, Mark S.; Wiseman, Gary H.; Musolf, Douglas J.; and Tanous, Adam C., 5,070,050, Cl. 501-108.000.

Wisting, Walter L. Fume hood. 5,069,197, Cl. 126-299.00E.

Wistuba, Eckehardt: *See*—
Dersch, Rolf; Dehne, Heinrich; Gellert, Roland; Mueller, Dietrich-Wolfgang; Vinke, Johannes; and Wistuba, Eckehardt, 5,070,136, Cl. 524-555.000.

Wiwi, Mark A., to Universal Cooperatives, Inc. Animal feeder. 5,069,164, Cl. 119-53.000.

Wohlwend, Ernst: *See*—
Obermeier, Josef; Magyari, Eugen; Ritt, Walter; Wohlwend, Ernst; Gassmann, Horst-Detlef; and Cavada, Peter, 5,069,584, Cl. 408-145.000.

Wojtowicz, Edward A.: *See*—
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Wold, Michael O.: *See*—
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Wolf, Thomas: *See*—
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Wolf, Wilhelm. Floor protecting attachment for the legs of bowed stringed musical instruments. 5,069,102, Cl. 84-280.000.

Wolff, George D. Magnet attachment to spring seat of fuel injection apparatus. 5,069,064, Cl. 73-119.00A.

Wolff, Robert A.; and Troxell, John F., Jr., to Wood-Mode, Incorporated. Backsplash system. 5,069,350, Cl. 211-87.000.

Wolfgram, Orval F.: *See*—
Smith, Paul R.; Wolfgram, Orval F.; and Kobelia, Rudolph G., 5,069,329, Cl. 198-752.000.

Wolfman, Dan: *See*—
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Womack, Robert C. Article multiple position swivel ball mount with position hold clamping. 5,069,433, Cl. 269-277.000.

Wong, Michael: *See*—
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Wong, Nam S.: *See*—
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Wong, Ngai C., to Massachusetts Institute of Technology. Ultrahigh-resolution optical parametric oscillator frequency measurement and synthesis system. 5,070,260, Cl. 359-330.000.

Wong, Pui K.; and Drent, Eit, to Shell Oil Company. Treatment of carbon monoxide/olefin copolymer with solvent. 5,070,184, Cl. 528-491.000.

Wood-Mode, Incorporated: *See*—
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Woodhead Industries, Inc.: *See*—
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Woodhouse, Robert C. Chemical dispensing system. 5,069,365, Cl. 222-105.000.

Woodings Industrial Corporation: *See*—
Woodings, Robert T.; and Mathews, Ronald J., 5,069,430, Cl. 266-271.000.

Woodings, Robert T.; and Mathews, Ronald J., to Woodings Industrial Corporation. Blast furnace tap hole drill with centralizing drill rod support. 5,069,430, Cl. 266-271.000.

Woodward, Thomas R. Programmably controlled partially distributed masking mechanism in a programmable unit having variable data path widths. 5,070,445, Cl. 395-500.000.

Wortman, Andrew, to ISTAR, Inc. Alleviation of aircraft fuselage form drag. 5,069,402, Cl. 244-130.000.

Wrasidlo, Wolfgang J., to Memtec America Corporation. Ultrapous thin-film membranes. 5,069,945, Cl. 427-245.000.

Wright, David L.: *See*—
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Wright, John J.: *See*—
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Wright, Joseph M.: *See*—
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Wu, Dennis, to Acer Incorporated. Keyboard scanning matrix. 5,070,330, Cl. 341-26.000.

Wu, Hai M. Toy police car with a retractable helicopter. 5,069,649, Cl. 446-288.000.

Wu, Jeng S.: *See*—
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Wuerzer, Bruno: *See*—
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Westphalen, Karl-Otto; Hamprecht, Gerhard; Wuerzer, Bruno; and Meyer, Norbert, 5,069,710, Cl. 71-92.000.

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Wysocki, Joseph A.; and Krajenbrink, Frans G., to Hughes Aircraft Company. Orientation control of float-zone grown TiC crystals. 5,069,743, Cl. 156-620.700.

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Robinette, Susan; Mammino, Joseph; Carmichael, Kathleen M.; Tokoli, Emery G.; Lynch, Anita P.; and Yu, Robert C. U., 5,069,993, Cl. 430-58.000.

Yabuno, Ryohei; and Takeda, Shin, to Aisin Seiki Kabushiki Kaisha. Method of making poly-V grooved pulley. 5,068,964, Cl. 29-892.300.

Yachigo, Shinichi: *See*—
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Yagi, Hisanori: *See*—
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Yagi, Sakai: *See*—
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Yahav, Shimon; and Daar, Yair, to Lancet S.A. Heating system employing an induction producing element and a high permeability foil. 5,070,222, Cl. 219-10.493.

Yamada, Satoshi: *See*—
Kodama, Shinji; Yamada, Satoshi; and Yagi, Sakai, 5,069,639, Cl. 439-595.000.

Yamada, Takeo: *See*—
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Yamada, Yasuhiro; Sakuda, Shohei; and Takayama, Seiji, to Ajinomoto Co., Inc. Demethylallosamidin and a process for production thereof. 5,070,191, Cl. 536-22.000.

Yamagata, Yasushi, to NEC Corporation. EPROM erasable by UV radiation having redundant circuit. 5,070,378, Cl. 357-23.500.

Yamagishi, Takashi; Yamamoto, Yukito; and Murakami, Yoji, to Teijin Limited. Thermal transfer record sheet. 5,069,944, Cl. 427-444.000.

Yamaguchi, Koshiro: *See*—
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Yamaha Corporation: *See*—
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Yamaha Hatsudoki Kabushiki Kaisha: *See*—
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Yamakawa, Tomio: *See*—
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Yamaki, Masatoshi: *See*—
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Yamamoto, Akihiko: *See*—
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Yamamoto, Hiroki: *See*—
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Yamamoto, Masamitsu; Kimura, Noriyuki; Fujioka, Yoshihisa; Yamamoto, Hiroki; and Suekane, Makoto, to Uni-Charm Corporation. Disposable diapers. 5,069,678, Cl. 604-385.100.

Yamamoto, Tamotsu: *See*—
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Yamamoto, Yasushi: *See*—
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Yamamoto, Yukito: *See*—
Yamagishi, Takashi; Yamamoto, Yukito; and Murakami, Yoji, 5,069,944, Cl. 427-444.000.

Yamane, Daiji; Horie, Nobuyuki; Taguchi, Aisaku; and Sugiura, Teruki, to Sharp Kabushiki Kaisha. Motor stop control device. 5,070,285, Cl. 318-461.000.

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Yamane, Masayuki; and Yasumori, Atsuo, to Tokyo Institute of Technology, President of. method of manufacturing gradient-index glass. 5,069,700, Cl. 65-17.000.

Yamano, Junpei: *See*—
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Murano, Katsuaki; Yamashita, Yoshinori; Hirano, Sadayuki; Tatsumi, Takumi; and Yamamoto, Hiroaki, 5,069,086, Cl. 74-866.000.

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Yamatake-Honeywell Co., Ltd.: *See*—
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Yamato Scale Company, Limited: *See*—
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Yamauchi, Kiyoshi; Kugo, Takahiro; and Miyano, Yasuo, to Tokin Corporation; and Terumo, Kabushiki Kaisha. Catheter guidewire with pseudo elastic shape memory alloy. 5,069,226, Cl. 128-772.000.

Yamauchi, Kiyotaka: *See*—
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Yamazaki, Junichi: *See*—
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Yamazaki, Shunpei; Konuma, Toshimitsu; Hamatani, Toshiji; Mase, Akira; Yamaguchi, Toshiharu; Sakama, Mitsunori; and Inujima, Takashi, to Semiconductor Energy Laboratory Co., Ltd. Liquid crystal device having asymmetrical opposed contiguous surfaces being driven by a unipolar driving source. 5,069,531, Cl. 359-55.000.

Yamazaki, Shuppei, to Semiconductor Energy Laboratory Co., Ltd. Printing member for electrostatic photocopying. 5,070,364, Cl. 355-211.000.

Yanagishita, Norio: *See*—
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Yanagita, Hiroaki; and Okada, Keiko, to Hoya Corporation. Halide laser glass and laser device utilizing the glass. 5,070,506, Cl. 372-40.000.

Yanai, Hidetoshi; and Ishikawa, Akira, to KAO Corporation. Magnetic recording medium with a back coat layer of nitrocellulose and polyurethane binder resins and which contains carbon black and titanium dioxide particles. 5,069,963, Cl. 428-323.000.

Yarchoan, Robert: *See*—
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Yarita, Kenichi; Tada, Takahisa; and Kasatani, Ryuichiro, to Ajinomoto Company, Inc. Method for crystallization of optically active tryptophan. 5,070,208, Cl. 548-494.000.

Yasuda, Hideo: *See*—
Yoshimura, Koji; and Yasuda, Hideo, 5,069,990, Cl. 429-206.000.

Yasuda, Hiroshi: *See*—
Kimura, Akira; Kitao, Nobuo; Yasuda, Hiroshi; Shimomura, Yoshimasa; Isozaki, Kiyoshi; and Nishimura, Hiroshi, 5,069,486, Cl. 285-166.000.

Yasumori, Atsuo: *See*—
Yamane, Masayuki; and Yasumori, Atsuo, 5,069,700, Cl. 65-17.000.

Yasumoto, Takaaki: *See*—
Nakagawa, Noriko; Yasumoto, Takaaki; and Nakai, Toshio, 5,070,393, Cl. 357-80.000.

Yasunaga, Tadashi; Kaneko, Shiro; and Sano, Kunihiko, to Fuji Photo Film Co., Ltd. Method for making magnetic recording media. 5,069,933, Cl. 427-130.000.

Yasunaga, Tadashi: *See*—
Nakada, Junji; Takeuchi, Hideaki; and Yasunaga, Tadashi, 5,069,932, Cl. 427-129.000.
Yasuno, Toshio; Thukagoshi, Toshihiro; Hoshii, Shinji; and Imaizumi, Yasuo, to Fuji Jukogyo Kabushiki Kaisha; and Teikoku Kuromu Co., Ltd. Method of machining a press die. 5,069,089, Cl. 76-107.100.
Yasuno, Yoshiki, to Nissan Motor Company, Limited. Anti-skid brake control system for automotive vehicle selective of two wheel drive mode and four wheel drive mode and technology of correlation of brake control and power train control for optimal braking efficiency and enhanced stability. 5,070,460, Cl. 364-426.020.
Yasuno, Yoshitake: *See*—
Mito, Yoshio; Kitagawa, Masatoshi; Hirao, Takashi; Yasuno, Yoshitake; and Hirano, Ryuma, 5,070,027, Cl. 437-15.000.
Yazaki Corporation: *See*—
Iino, Tadashi; and Aoki, Kunimitsu, 5,070,323, Cl. 340-705.000.
Kodama, Shinji; Yamada, Satoshi; and Yagi, Sakai, 5,069,639, Cl. 439-595.000.
Yeda Research and Development Company Limited: *See*—
Lidor, Cobi; Dekel, Samuel; Edelstein, Samuel; and Meyer, Michael S., 5,069,905, Cl. 424-423.000.
Yen, Richard C. K. Manufacturing protein microspheres. 5,069,936, Cl. 427-213.330.
Yeo, Denis; and Boatwright, David A., to Westinghouse Electric Corp. Method of forming a gripper cavity in a fuel rod end plug. 5,069,865, Cl. 376-451.000.
Yhtyneet Paperitehtaat Oy Walki-Pakkaus: *See*—
Kleemola, Pertti, 5,069,101, Cl. 83-869.000.
Yin, Hezhu; Harris, Jerry M.; and Nur, Amos M., to Leland Stanford Junior University, The Board of Trustees of the. Low impedance down-hole acoustic source for well logging. 5,069,308, Cl. 181-106.000.
Yokobori, Jun: *See*—
Murahashi, Takashi; Sugano, Masashi; Maruyama, Hiroyuki; and Yokobori, Jun, 5,070,374, Cl. 355-326.000.
Sugano, Masahi; Murahashi, Takashi; Maruyama, Hiroyuki; and Yokobori, Jun, 5,070,367, Cl. 355-326.000.
Yokoi, Hidetoshi; Okumura, Toshikato; Nakamura, Yukio; Yoneoka, Noriei; and Hachikawa, Syuiti, to Yokoi, Hidetoshi; and Kabushiki Kaisha Fujikoshi. Injection method. 5,069,833, Cl. 264-23.000.
Yokose, Kenji: *See*—
Matsui, Tetsuya; Kitamori, Takehiko; Yokose, Kenji; and Sakagami, Masaharu, 5,070,300, Cl. 324-464.000.
Yokota, Junichiro: *See*—
Takasu, Hiroshi; Arase, Susumu; Yokota, Junichiro; and Nakayama, Kazuo, 5,069,855, Cl. 264-235.000.
Yokota, Masahisa; Shimizu, Atsushi; Komiya, Kyosuke; Yamataka, Kazunori; and Nomura, Tadanori, to Asahi Kasei Kogyo Kabushiki Kaisha. Thermoplastic polyurethane. 5,070,173, Cl. 528-85.000.
Yokota, Shinichi: *See*—
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 5,070,172, Cl. 528-76.000.
Yokoya, Hiroaki: *See*—
Tachikawa, Hiromichi; Yokoya, Hiroaki; Watarai, Syu; and Aoai, Toshiaki, 5,069,992, Cl. 430-49.000.
Yokoya, Yuji: *See*—
Tsutsumi, Yasuhiro; Yokoya, Yuji; Hara, Yoshimichi; Matsunaga, Eiju; Kawata, Hiroyuki; Fukami, Akira; and Suzuki, Yutaka, 5,069,476, Cl. 280-707.000.
Yokoyama, Kenji; Nakayama, Masatoshi; Shimozawa, Toru; Ueda, Kunihiro; and Maruta, Fumio, to TDK Corporation. Magnetic recording medium. 5,069,967, Cl. 428-336.000.
Yonehara, Takao: *See*—
Satoh, Tamotsu; Yonehara, Takao; and Nakamura, Yoshio, 5,070,034, Cl. 437-52.000.
Yonekawa, Takashi; Buma, Shuuichi; Aburaya, Toshio; Sato, Kunihito; Kawanishi, Masaki; Hamada, Toshiaki; and Tagawa, Shinichi, to Toyota Jidosha Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Fluid pressure type active suspension having variable performance responsive to front to rear wheel steering angle ratio. 5,069,475, Cl. 280-707.000.
Yoneoka, Noriei: *See*—
Okumura, Toshikata; Nakamura, Yukio; Yoneoka, Noriei; and Hachikawa, yuiti, 5,069,832, Cl. 264-23.000.
Yokoi, Hidetoshi; Okumura, Toshikato; Nakamura, Yukio; Yoneoka, Noriei; and Hachikawa, Syuiti, 5,069,833, Cl. 264-23.000.
York, Billie M., Jr., to Alcon Laboratories, Inc. Spiro-tricyclicaromatic succinimide derivatives. 5,070,100, Cl. 514-387.000.
Yoshida, Kazuaki: *See*—
Naruse, Hideaki; and Yoshida, Kazuaki, 5,070,003, Cl. 430-389.000.
Yoshida Kogyo K. K.: *See*—
Ishikawa, Kiichirou; Fukumoto, Yasuhiro; and Dudek, Chet, 5,069,148, Cl. 112-104.000.
Yuki, Kenji, 5,068,950, Cl. 24-429.000.
Yoshida, Masato: *See*—
Togai, Kazuhide; Danno, Yoshiaki; Yoshida, Masato; Shimada, Makoto; and Ueda, Katsunori, 5,069,181, Cl. 123-399.000.
Yoshida, Suguru: *See*—
Inoue, Kazuo; Sano, Shoichi; Ogura, Misami; Nagahiro, Kenichi; Konno, Tsuneo; Kajiwara, Hajime; Ono, Yoshinobu; Yoshida, Suguru; Shimada, Hiroo; and Hashiguchi, Masahiro, 5,069,306, Cl. 180-291.000.
Yoshikawa, Masanori; Tateno, Haruo; Obana, Hiroshi; Itoh, Tsutomu; Saitoh, Hiroshi; and Kitoh, Masayuki, to Onoda Cement Company, Ltd. Method for making diamond and apparatus therefor. 5,070,274, Cl. 315-111.210.
Yoshimi, Isao: *See*—
Okuyama, Nobutaka; Sakurai, Soichi; Kitou, Kouji; Ohsawa, Michitaka; Niitsu, Ichiro; Yoshioka, Hiroshi; Takeyama, Atushi; Obara, Masao; and Yoshimi, Isao, 5,070,280, Cl. 315-368.110.
Yoshimoto, Hataaki; and Ito, Katsuhiro, to Ube Industries Ltd. Liquid crystal display device. 5,070,326, Cl. 340-719.000.
Yoshimoto, Kyosuke: *See*—
Ogawa, Masaharu; Nakajima, Yoshiki; Ito, Osamu; Furukawa, Teruo; Yoshimoto, Kyosuke; Tanaka, Kunimaro; Ototake, Masafumi; and Ozaki, Minoru, 5,070,492, Cl. 369-47.000.
Yoshimura, Katsuji: *See*—
Ishii, Yoshiki; Shimokoriyama, Makoto; Shimizu, Tetsuya; Yoshimura, Katsuji; Fujii, Akio; and Sasatani, Tomohiko, 5,070,402, Cl. 358-135.000.
Yoshimura, Koji; and Yasuda, Hideo, to Japan Storage Battery Co., Ltd. Sealed alkaline secondary battery. 5,069,990, Cl. 429-206.000.
Yoshimura, Noriaki: *See*—
Hirai, Koji; Taniguchi, Shunro; Ishiguro, Michihiro; Murata, Yoshifumi; Yokota, Shinichi; Ishii, Masao; Yoshimura, Noriaki; and Okamura, Takayuki, 5,070,172, Cl. 528-76.000.
Yoshimura, Yuichiro: *See*—
Tanaka, Atsushi; Kaneko, Kiyoshi; Yoshimura, Yuichiro; Suzuki, Noriyuki; Kobayashi, Katsuyuki; Mori, Shigeki; and Taniishi, Shinnosuke, 5,070,325, Cl. 340-706.000.
Yoshino, Yasushi: *See*—
Masaki, Mitsuo; Yamakawa, Tomio; Satoh, Masaru; Takeda, Hiromitsu; Yoshino, Yasushi; and Matsukura, Hitoshi, 5,070,089, Cl. 514-255.000.
Yoshioka, Hiroshi: *See*—
Okuyama, Nobutaka; Sakurai, Soichi; Kitou, Kouji; Ohsawa, Michitaka; Niitsu, Ichiro; Yoshioka, Hiroshi; Takeyama, Atushi; Obara, Masao; and Yoshimi, Isao, 5,070,280, Cl. 315-368.110.
Yoshizawa, Yoshihito; and Yamauchi, Kiyotaka, to Hitachi Metals, Ltd. Low-frequency transformer. 5,069,731, Cl. 148-305.000.
Young, Alan M.; and Blake, E. Ronald, to Exac Corporation. Apparatus and method for measuring the mass flow rate of material flowing through at least one vibrating conduit. 5,069,074, Cl. 73-861.380.
Young, Ferris F. Infant exerciser guard. 5,069,311, Cl. 188-32.000.
Young, Roger. Vacuum producing device. 5,069,582, Cl. 406-153.000.
Young, Vincent R.: *See*—
Bridges, Jack E.; Bajzek, Thomas J.; Hofer, Kenneth E.; Spencer, Homer L.; Smith, Larry G.; and Young, Vincent R., 5,070,533, Cl. 392-301.000.
Yu, Dave. Multipoint measuring system with measuring mechanism for fast exchanging of chucking appliance and automatic material withdrawal. 5,068,973, Cl. 33-549.000.
Yu, Robert C. U.: *See*—
Robinette, Susan; Mammino, Joseph; Carmichael, Kathleen M.; Tokoli, Emery G.; Lynch, Anita P.; and Yu, Robert C. U., 5,069,993, Cl. 430-58.000.
Yuan, Jack H.; and Harari, Eliyahou, to SunDisk Corporation. Method of making dense flash EEprom semiconductor memory structures. 5,070,032, Cl. 437-43.000.
Yuasa, Kimihiro; Hashimoto, Kenji; and Fujimoto, Tetsuo, to Idemitsu Kosan Co., Ltd. Method of orienting liquid crystal optical device. 5,069,533, Cl. 359-76.000.
Yuge, Yuko: *See*—
Takayama, Yukio; and Yuge, Yuko, 5,069,112, Cl. 98-69.000.
Yugi, Akira: *See*—
Nakajima, Takashi; Yugi, Akira; and Iwase, Shinichi, 5,069,979, Cl. 428-644.000.
Yukawa, Masahiko: *See*—
Kohtoh, Noriaki; Kobayashi, Takashi; and Yukawa, Masahiko, 5,070,182, Cl. 528-353.000.
Yuki, Eiji: *See*—
Kuzuya, Susumu; Shimizu, Seiji; Kato, Mikio; Ishikawa, Yujiro; Sakai, Takashi; and Yuki, Eiji, 5,069,557, Cl. 400-120.000.
Yuki, Kenji, to Yoshida Kogyo K. K. Provisional pull tab for slide fastener sliders. 5,068,950, Cl. 24-429.000.
Yuki, Yoshio; and Hara, Takafumi, to Sharp Kabushiki Kaisha. Cylindrical wall member for ink liquid resevoir mounted on a carriage in an ink jet system printer. 5,070,347, Cl. 346-140.00R.
Zahn, Christian, to Schuberth-Werk GmbH. & Co., KG. Military safety helmet. 5,068,922, Cl. 2-6.000.
Zahnradfabrik Friedrichshafen AG: *See*—
Loffler, Alfons; Marte, Walter; and Wiggermann, Peter, 5,069,111, Cl. 91-516.000.
Zaiss, Roland: *See*—
Kunze-Concewitz, Horst; and Zaiss, Roland, 5,069,155, Cl. 118-52.000.
Zalesky, Paul J.: *See*—
Guess, Joe F.; and Zalesky, Paul J., 5,069,664, Cl. 604-22.000.
Zarnoti, Sandor J. Game apparatus and method. 5,069,459, Cl. 273-241.000.
Zauner, Erwin: *See*—
Althaus, Rolf; and Zauner, Erwin, 5,069,600, Cl. 417-64.000.
Zawadzki, Andrzej: *See*—
Jacob, Allan S.; and Zawadzki, Andrzej, 5,069,068, Cl. 73-313.000.
Zdebel, Peter J., to Motorola, Inc. Complementary semiconductor region fabrication. 5,070,031, Cl. 437-33.000.
Zebco Corporation: *See*—
Henderson, William A., 5,069,642, Cl. 440-6.000.

Zegarski, William J., to Du Pont de Nemours, E. I., and Company. Mixed phosphor x-ray intensifying screens with improved resolution. 5,069,982, Cl. 428-690.000.

Zeiss, Armin: *See*—
Schuricht, Jurgen; and Zeiss, Armin, 5,070,463, Cl. 364-464.020.

Zelinka, Robert F.; and Redding, John W., to Perkins Manufacturing Company. Lifting device. 5,069,593, Cl. 414-408.000.

Zengin, Osman Z., to Miba Sintermetall Aktiengesellschaft. Process of manufacturing high-strength sintered members. 5,069,867, Cl. 419-15.000.

Zhu, Ming-De; Rodriguez, Roberto; and Wehr, C. Timothy, to Bio-Rad Laboratories, Inc. Suppression of electroendosmosis in capillary electrophoresis. 5,069,766, Cl. 204-180.100.

Zillgitt, Ulrich; Speer, Harald; Haug, Kurt; Ebinger, Georg; Millers, Miervaldis; and Hasselmann, Heinrich, to Robert Bosch GmbH. Headlight for a motor vehicle having an adjustable motor-driven reflector. 5,070,433, Cl. 362-66.000.

Zinn, Egon: *See*—
Kaufmann, Friedrich; Schlossherr, Horst-Werner; and Zinn, Egon, 5,069,122, Cl. 101-9.000.

Zinnanti, Anthony, Jr. Endometrial aspirator. 5,069,224, Cl. 128-752.000.

Zinner, Norman R.; and Sterling, Arthur M. Penile prosthesis and method. 5,069,201, Cl. 128-79.000.

Zobl, Hartmut: *See*—
Haubner, Georg; and Zobl, Hartmut, 5,070,481, Cl. 365-228.000.

Zoran Corporation: *See*—
Sinar, Alexander B.; Gerzberg, Levy; Shacham, Yosef Y.; Blech, Ilan A.; and Sirkin, Eric R., 5,070,383, Cl. 357-51.000.

Zubelli, Jorge P.: *See*—
Singer, Jerome R.; Grunbaum, Francisco A.; Kohn, Philip D.; Zubelli, Jorge P.; Couch, John L.; Naparst, Harold L.; and Latham, Geoffrey, 5,070,455, Cl. 364-413.190.

Zuckerman, Lawrence H., to Masco Industries, Inc. Reversing apparatus for powered vehicle door systems. 5,069,000, Cl. 49-28.000.

Zuger, Othmar, to Sandoz Ltd. Pharmaceutical 9,10-dihydrogenated ergot alkaloid containing compositions. 5,069,911, Cl. 424-469.000.

Zumo, Anthony G.: *See*—
Taylor, Donald J.; Zumo, Anthony G.; and Bussema, John R., 5,069,072, Cl. 73-756.000.

Zuviria, Marcelo M. Solid rectangular building block for a toy building set. 5,069,647, Cl. 446-127.000.

Zwicknagl, Hans-Peter: *See*—
Tews, Helmut; and Zwicknagl, Hans-Peter, 5,070,028, Cl. 437-22.000.

Zysset, Edgar H., to Automated Container Corporation. Easy open end with temporary retention center for safety purposes. 5,069,356, Cl. 220-276.000.

333 Products, Inc.: *See*—
Jacob, Richard J., 5,069,412, Cl. 248-493.000.

501 Johnson Matthey Public Limited Company: *See*—
Cole, Donald; and Smith, Robert W., 5,069,954, Cl. 428-202.000.

501 Mita Industrial Co., Ltd.: *See*—
Fukano, Masahiko; and Muraoka, Toshinori, 5,070,373, Cl. 355-290.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF DECEMBER, 1991

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Brauer, Melvin; Downey, William J.; and Naughton, Frank C., to CasChem, Inc. Ricinoleate plasticizers for polyurethane compositions. Re. 33,761, Cl. 524-310.000.

Carder, William E. Pile carpet trimmer. Re. 33,756, Cl. 30-216.000.

CasChem, Inc.: *See*—
Brauer, Melvin; Downey, William J.; and Naughton, Frank C., Re. 33,761, Cl. 524-310.000.

Compeau, David E.; Kuhlman, Howard W.; and Rogers, Lloyd W., Jr., to General Motors Corporation. Closure panel pull down mechanism. Re. 33,758, Cl. 292-216.000.

DePasquale, Ralph J.; and Wilson, Michael E., to PCR Group, Inc. Aqueous systems containing silanes for rendering masonry surfaces water repellant. Re. 33,759, Cl. 106-2.000.

Downey, William J.: *See*—
Brauer, Melvin; Downey, William J.; and Naughton, Frank C., Re. 33,761, Cl. 524-310.000.

Dresser Industries, Inc.: *See*—
Weaver, Gary E., Re. 33,757, Cl. 175-329.000.

General Motors Corporation: *See*—
Compeau, David E.; Kuhlman, Howard W.; and Rogers, Lloyd W., Jr., Re. 33,758, Cl. 292-216.000.

Howard, Ronald A., to Ucar Carbon Technology Corporation. High purity, high temperature pipe thread sealant paste. Re. 33,760, Cl. 106-285.000.

Kuhlman, Howard W.: *See*—
Compeau, David E.; Kuhlman, Howard W.; and Rogers, Lloyd W., Jr., Re. 33,758, Cl. 292-216.000.

Naughton, Frank C.: *See*—
Brauer, Melvin; Downey, William J.; and Naughton, Frank C., Re. 33,761, Cl. 524-310.000.

PCR Group, Inc.: *See*—
DePasquale, Ralph J.; and Wilson, Michael E., Re. 33,759, Cl. 106-2.000.

Rogers, Lloyd W., Jr.: *See*—
Compeau, David E.; Kuhlman, Howard W.; and Rogers, Lloyd W., Jr., Re. 33,758, Cl. 292-216.000.

Ucar Carbon Technology Corporation: *See*—
Howard, Ronald A., Re. 33,760, Cl. 106-285.000.

Weaver, Gary E., to Dresser Industries, Inc. Diamond drill bit with varied cutting elements. Re. 33,757, Cl. 175-329.000.

Wilson, Michael E.: *See*—
DePasquale, Ralph J.; and Wilson, Michael E., Re. 33,759, Cl. 106-2.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Ausnit, Steven, to Minigrip, Inc. Method and apparatus for making reclosable bags with fastener strips in a form fill and seal machine. B1 4,894,975, 12-3-91, Cl. 53-412.000.

Flowmaster, Inc.: *See*—
Flugger, Ray T., B1 4,574,914, Cl. 181-268.000.

Flugger, Ray T., to Flowmaster, Inc. Compact, sound-attenuating muffler for high-performance internal combustion engine. B1 4,574,914, 12-3-91, Cl. 181-268.000.

Metal Box p.l.c.: *See*—
Taube, William L.; and Roberts, David A., B1 4,606,472, Cl. 220-500.000.

Minigrip, Inc.: *See*—
Ausnit, Steven, B1 4,894,975, Cl. 53-412.000.

Roberts, David A.: *See*—
Taube, William L.; and Roberts, David A., B1 4,606,472, Cl. 220-500.000.

Taube, William L.; and Roberts, David A., to Metal Box p.l.c. Reinforced can end. B1 4,606,472, 12-3-91, Cl. 220-500.000.

LIST OF DESIGN PATENTEES

Adams, Duane D.; and Muller, Ronald L., to North American Philips Corporation. Thermal carafe. 322,007, 12-3-91, Cl. D7-317.000.

Adams, Russell S. Rotatable sign. 322,096, 12-3-91, Cl. D20-21.000.

Aeromix Systems, Incorporated: *See*—
Gross, Peter S., 322,118, Cl. D23-213.000.

Altrack Limited: *See*—
Rollinson, Phillip J., 322,076, Cl. D15-28.000.

American Hovercraft & Sports, Inc.: *See*—
Chia, Louis; and Omori, Satoaki, 322,059, Cl. D12-307.000.

American Optical Corporation: *See*—
Desy, Raoul O., 322,079, Cl. D16-111.000.

American Technical Ceramics Corporation: *See*—
Davis, Donald J., Jr., 322,015, Cl. D8-14.000.

Andersen, Poul K.: *See*—
Knudsen, Lis; and Andersen, Poul K., 322,027, Cl. D9-367.000.

Anderson, William S., to STX, Inc. Kneepad. 322,146, 12-3-91, Cl. D29-10.000.

Antonious, Anthony J. Golf club head. 322,108, 12-3-91, Cl. D21-217.000.

Antonious, Anthony J. Golf club head. 322,109, 12-3-91, Cl. D21-217.000.

Antonious, Anthony J. Golf club head. 322,110, 12-3-91, Cl. D21-217.000.

Antonious, Anthony J. Putter type golf club head. 322,111, 12-3-91, Cl. D21-217.000.

Antonious, Anthony J. Iron type golf club head. 322,113, 12-3-91, Cl. D21-220.000.

Antonious, Anthony J. Iron type golf club head. 322,114, 12-3-91, Cl. D21-220.000.

Appleby, Paul; and Moscovitch, Jerry N. Dispenser. 322,028, 12-3-91, Cl. D9-370.000.

Araki, Shigeki, to Kabushiki Kaisha Tamiya Mokei. Toy car. 322,102, 12-3-91, Cl. D21-137.000.

Archer, William. Clip for a cassette case or the like. 322,024, 12-3-91, Cl. D8-395.000.

Arnulf, Paul; and Girard, Francois, to Salomon S.A. Sole section of a sport shoe. 321,975, 12-3-91, Cl. D2-320.000.

Artemide S.p.A.: *See*—
Gismondi, Ernesto, 322,142, Cl. D26-88.000.

Asics Corporation: *See*—
Kiyosawa, Junichi, 321,976, Cl. D2-320.000.

Asner, Jerome L. Lazy Susan tray. 322,011, 12-3-91, Cl. D7-501.000.

Bajork, Leonard C. Foot covering for beach and pool. 321,971, 12-3-91, Cl. D2-273.000.

Bausch & Lomb Incorporated: *See*—
Ramp, Robert H., 322,080, Cl. D16-102.000.

Bean, W. Edward. Tabletop novelty. 322,045, 12-3-91, Cl. D11-131.000.

Becker, Adolf F. Wall coping. 322,130, 12-3-91, Cl. D25-58.000.

Berger, Hugo: *See*—
Strasser, Florian; and Berger, Hugo, 322,038, Cl. D10-39.000.

Bergin, James T.; and Urella, Richard M., to David Clark Company Incorporated. Headphone. 322,071, 12-3-91, Cl. D14-206.000.

Berriman, Richard E.: *See*—
McClelland, Donald R.; Bloyer, Donald R.; Berriman, Richard E.; and Chu, Robin W. C., 322,090, Cl. D18-55.000.

Berwick Manufacturing, Inc.: *See*—
Palisin, Stephen P., Jr., 322,032, Cl. D9-429.000.
Palisin, Stephen P., Jr.; and Keller, Raymond J., 322,033, Cl. D9-429.000.

Bestop, Inc.: *See*—
Bruce, Douglas A.; and Rosmerl, Tim J., 322,055, Cl. D12-156.000.

Better Sleep Manufacturing Co.: *See*—
Emery, William W., 322,002, Cl. D6-566.000.

Billet, Robert L., to Thirst Aid, Inc. Portable beverage dispenser. 321,980, 12-3-91, Cl. D3-32.000.

Blease, Wilfred J., to Pioneer Plastics, Inc. Self-powered bait troller. 322,116, 12-3-91, Cl. D22-134.000.

Bloyer, Donald R.: *See*—
McClelland, Donald R.; Bloyer, Donald R.; Berriman, Richard E.; and Chu, Robin W. C., 322,090, Cl. D18-55.000.

Bolle, Maurice, to Etablissments Bolle S.N.C. Water sport goggles. 322,082, 12-3-91, Cl. D16-102.000.

Bradley, John M. Aerofoil for a windscreen wiper arm. 322,053, 12-3-91, Cl. D12-155.000.

Braun Aktiengesellschaft: *See*—
Littmann, Ludwig, 322,008, Cl. D7-376.000.

Bressler Group, Inc.: *See*—
Schneider, Eric A., 322,144, Cl. D28-46.000.

Brown, Jack W.: *See*—
Lichte, Leo J.; and Brown, Jack W., 322,124, Cl. D24-117.000.

Brown, Paul L.; and Levy, Richard C. Gyro top. 322,100, 12-3-91, Cl. D21-95.000.

Bruce, Douglas A.; and Rosmerl, Tim J., to Bestop, Inc. Vehicle soft top. 322,055, 12-3-91, Cl. D12-156.000.

Butler, Brian T., to Butler Specialties, Inc. Vehicle seat or similar article. 321,992, 12-3-91, Cl. D6-356.000.

Butler Specialties, Inc.: *See*—
Butler, Brian T., 321,992, Cl. D6-356.000.

Buttery, John R.: *See*—
Doman, Trevor D.; Buttery, John R.; and Gould, Royston M., 322,049, Cl. D12-85.000.

Canning, Robert A. Revolving photographic slide holder. 322,085, 12-3-91, Cl. D16-236.000.

Canon Kabushiki Kaisha: *See*—
Tokuda, Hiroyuki, 322,091, Cl. D18-54.000.

Caputo, Mauro D., to Eau de Cologne- & Perfumerie-Fabrik. Combined bottle and cap. 322,029, 12-3-91, Cl. D9-403.000.

Casio Computer Co., Ltd.: *See*—
Takani, Naomi, 322,037, Cl. D10-32.000.

Chappelle, John F.: *See*—
Tackett, Gary W.; and Chappelle, John F., 321,983, Cl. D3-38.000.

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Doggett, Lawrence A., to Whirlpool Corporation. Food mixer. 322,010, 12-3-91, Cl. D7-379.000.

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Rivera, Jose L. G., to Universal Network, Inc. Book clip. 322,095, 12-3-91, Cl. D19-65.000.

Rollinson, Phillip J., to Altrack Limited. Ground engaging tread element for a wheel or endless track. 322,076, 12-3-91, Cl. D15-28.000.

Ronningen Research & Development Company: *See—*
Eickhoff, Jon H., 322,131, Cl. D25-62.000.
Eickhoff, Jon H., 322,132, Cl. D25-62.000.
Eickhoff, Jon H., 322,134, Cl. D25-68.000.

Rosen, James, to Pace Collection, Inc., The. Side table. 322,000, 12-3-91, Cl. D6-487.000.

Rosmerl, Tim J.: *See—*
Bruce, Douglas A.; and Rosmerl, Tim J., 322,055, Cl. D12-156.000.

Rotpunkt Dr. Anso Zimmermann: *See—*
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Rufcut, Inc.: *See—*
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Ryobi Motor Products Corp.: *See—*
Thurler, James E.; Snoke, Philip J.; and Moore, Devin L., 322,016, Cl. D8-62.000.

Saarinen, Kari, to Lannen Tehtaat Oy. Tray for growing plants. 322,048, 12-3-91, Cl. D11-155.000.

Saiger, Herbert C., to Crown Leisure Products, Inc. Chair frame. 321,995, 12-3-91, Cl. D6-379.000.

Salomon S.A.: *See—*
Arnulf, Paul; and Girard, Francois, 321,975, Cl. D2-320.000.

Sanshin Dengu Manufacturing Co., Ltd.: *See—*
Shima, Susumu; Hirose, Hideto; Ishii, Masaaki; and Iijima, Kohnosuke, 322,136, Cl. D26-28.000.

Sawada, Masaji; and Nishida, Koji, to Sharp Corporation. Calculator. 322,088, 12-3-91, Cl. D18-7.000.

Scheper, Robert M., to Steelcase Inc. Chair. 321,994, 12-3-91, Cl. D6-373.000.

Schindler, John; and Schindler, Josephine. Ice cream cone cover. 321,968, 12-3-91, Cl. D1-116.000.

Schindler, Josephine: *See—*
Schindler, John; and Schindler, Josephine, 321,968, Cl. D1-116.000.

Schneider, Eric A., to Bressler Group, Inc. Safety razor. 322,144, 12-3-91, Cl. D28-46.000.

Schonherr, Thomas: *See—*
Haug, Andreas; and Schonherr, Thomas, 322,119, Cl. D23-223.000.

Sears, Roebuck & Co.: *See—*
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Seikosha Co., Ltd.: *See—*
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Wada, Mitsuo, 322,036, Cl. D10-27.000.

Seima Italiana SpA: *See—*
Hasuike, Makio, 321,999, Cl. D6-446.000.

Sephton, Gary K. Net support. 322,104, 12-3-91, Cl. D21-201.000.

Seror, Isaac, to Kriss Electronic International Ltd. Audio amplifier or similar article. 322,069, 12-3-91, Cl. D14-188.000.

Sharp Corporation: *See—*
Sawada, Masaji; and Nishida, Koji, 322,088, Cl. D18-7.000.

Shima, Susumu; Hirose, Hideto; Ishii, Masaaki; and Iijima, Kohnosuke, to Sanshin Dengu Manufacturing Co., Ltd. Remote controlled searchlight for vehicle, boat, or the like. 322,136, 12-3-91, Cl. D26-28.000.

Smith Corona Corporation: *See—*
Kasprzycki, Robert L., 322,087, Cl. D18-1.000.

Smith, Lee A. Shower enclosure. 322,123, 12-3-91, Cl. D23-283.000.

Snoke, Philip J.: *See—*
Thurler, James E.; Snoke, Philip J.; and Moore, Devin L., 322,016, Cl. D8-62.000.

Snyder, Jeffrey; and Fung, May, to Etna Products Co. Inc. Combined automatic toothbrush set and holder therefor. 321,986, 12-3-91, Cl. D4-101.000.

Sony Corporation: *See—*
Yasuhara, Nae, 321,982, Cl. D3-35.000.

Southern Case, Inc.: *See—*
Ward, William W., 321,985, Cl. D3-73.000.

Spalding & Evenflo Companies, Inc.: *See—*
Meeker, Paul K., 322,001, Cl. D6-495.000.

Spreckelmeier, Lawrence E., to Ethicon, Inc. Combined linear surgical stapler and cutter. 322,143, 12-3-91, Cl. D24-145.000.

Steelcase Inc.: *See—*
Scheper, Robert M., 321,994, Cl. D6-373.000.

Stillwagon, Woodrow C. Key holder. 321,984, 12-3-91, Cl. D3-61.000.

Strasser, Florian; and Berger, Hugo, to North American Watch Corporation. Wrist watch. 322,038, 12-3-91, Cl. D10-39.000.

STX, Inc.: *See—*
Anderson, William S., 322,146, Cl. D29-10.000.

Sugano, Hisako, to Seikosha Co., Ltd. Clock. 322,035, 12-3-91, Cl. D10-23.000.

Sunrise Medical Limited: *See—*
Doman, Trevor D.; Buttery, John R.; and Gould, Royston M., 322,049, Cl. D12-85.000.

Tabuchi, Masahiko, to Kabushiki Kaisha Toshiba. Video surveillance camera body. 322,084, 12-3-91, Cl. D16-203.000.

Tackett, Gary W.; and Chappelle, John F., to Rufcut, Inc. Fishing tackle box. 321,983, 12-3-91, Cl. D3-38.000.

Takani, Naomi, to Casio Computer Co., Ltd. Wrist watch. 322,037, 12-3-91, Cl. D10-32.000.

Takenouchi, Kenji; Makita, Toshihiko; and Norizuki, Teruhisa, to Yazaki Corporation. Electrical connector housing. 322,062, 12-3-91, Cl. D13-133.000.

Taylor, Ward E.: *See—*
Zagaroli, David P.; and Taylor, Ward E., 321,993, Cl. D6-366.000.

Textron Inc.: *See—*
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Thirst Aid, Inc.: *See*—
Billet, Robert L., 321,980, Cl. D3-32.000.
Thurler, James E.; Snoke, Philip J.; and Moore, Devin L., to Ryobi Motor Products Corp. Right angle sander/grinder. 322,016, 12-3-91, Cl. D8-62.000.
Tokuda, Hiroyuki, to Canon Kabushiki Kaisha. Laser beam printer. 322,091, 12-3-91, Cl. D18-54.000.
Tonka Corporation: *See*—
Ma, Hansan, 322,105, Cl. D21-205.000.
Tsubakimoto Bulk Systems Corporation: *See*—
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U.S. Philips Corporation: *See*—
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Upthegrove, William, Jr.; and Montgomery, Joel A., Jr., to Maverick Mountain, Inc. Pair of chaps. 321,969, 12-3-91, Cl. D2-225.000.
Urella, Richard M.: *See*—
Bergin, James T.; and Urella, Richard M., 322,071, Cl. D14-206.000.
Van Allman, Don T.; and Gupta, Harish C., to Illinois Tool Works Inc. Thread protecting and guiding cap. 322,017, 12-3-91, Cl. D8-70.000.
Van Allman, Don T.; and Gupta, Harish C., to Illinois Tool Works Inc. Guidance device. 322,018, 12-3-91, Cl. D8-70.000.
van Mourik, Okke O., to U.S. Philips Corporation. Hearing aid. 322,126, 12-3-91, Cl. D24-174.000.
Wada, Mitsuo, to Seikosha Co., Ltd. Clock. 322,036, 12-3-91, Cl. D10-27.000.
Wang, Howard. Flashlight. 322,139, 12-3-91, Cl. D26-49.000.
Ward, William W., to Southern Case, Inc. Case for cordless power ratchet tool. 321,985, 12-3-91, Cl. D3-73.000.
Wasolek, John J.: *See*—
Corneau, Christopher C.; and Wasolek, John J., 322,133, Cl. D25-67.000.
Watanabe, Katsuhito, to Oki Electric Industry Co., Ltd. Battery charger for a portable radio telephone. 322,061, 12-3-91, Cl. D13-108.000.
Weihe, James M. Leaf carrier. 322,014, 12-3-91, Cl. D8-1.000.
Whirlpool Corporation: *See*—
Doggett, Lawrence A., 322,009, Cl. D7-379.000.
Doggett, Lawrence A., 322,010, Cl. D7-379.000.
Whitright, Curt E. Straw. 322,004, 12-3-91, Cl. D7-300.200.
Widrig, Craig J. Pair of visors with extendable shades for vehicles. 322,056, 12-3-91, Cl. D12-191.000.
Wierzbicki, Julian J.; and Lester, James N., to GTE Products Corporation. Infrared luminaire for security system or the like. 322,135, 12-3-91, Cl. D26-24.000.
Wilson, Joyce A. Automatic pot scrubber. 321,989, 12-3-91, Cl. D4-128.000.
Wolfenden, Anthony H., to Decor Corporation Pty. Ltd., The. Planter. 322,047, 12-3-91, Cl. D11-153.000.
Woods, Larnell. Illuminated flower pot. 322,046, 12-3-91, Cl. D11-144.000.
Yamaha Corporation: *See*—
Yamakawa, Yoshiro, 322,067, Cl. D14-168.000.
Yamakawa, Yoshiro, 322,068, Cl. D14-168.000.
Yamamoto, Kentaro, 322,072, Cl. D14-214.000.
Yamawaki, Yasuo; and Mizushima, Kazuyuki, 322,086, Cl. D17-7.000.
Yamakawa, Yoshiro, to Yamaha Corporation. Stereo. 322,067, 12-3-91, Cl. D14-168.000.
Yamakawa, Yoshiro, to Yamaha Corporation. Combined amplifier and radio tuner. 322,068, 12-3-91, Cl. D14-168.000.
Yamamoto, Kentaro, to Yamaha Corporation. Loudspeaker. 322,072, 12-3-91, Cl. D14-214.000.
Yamawaki, Yasuo; and Mizushima, Kazuyuki, to Yamaha Corporation. Electronic piano. 322,086, 12-3-91, Cl. D17-7.000.
Yasuhara, Nae, to Sony Corporation. Compact disc case. 321,982, 12-3-91, Cl. D3-35.000.
Yazaki Corporation: *See*—
Takenouchi, Kenji; Makita, Toshihiko; and Norizuki, Teruhisa, 322,062, Cl. D13-133.000.
Yeh, Tsun H., to Chwen Ho Chuang Co., Ltd. Video cassette rewinder. 322,073, 12-3-91, Cl. D14-239.000.
Yonai, Masato: *See*—
Kataoka, Tetsuro; and Yonai, Masato, 322,050, Cl. D12-1.000.
Kataoka, Tetsuro; and Yonai, Masato, 322,051, Cl. D12-1.000.
Yonezawa, Tsuyoshi: *See*—
Matsumoto, Chozo; and Yonezawa, Tsuyoshi, 322,129, Cl. D25-52.000.
Yuen, John S., to John Manufacturing Limited. Water resistant multi-function lantern. 322,137, 12-3-91, Cl. D26-42.000.
Yuen, John S., to John Manufacturing Limited. Waterproof flashlight. 322,141, 12-3-91, Cl. D26-49.000.
Zagaroli, David P.; and Taylor, Ward E. Chair. 321,993, 12-3-91, Cl. D6-366.000.
Ziebarth, Gerd H., to U.S. Philips Corporation. Combined video cassette recorder and television receiver. 322,065, 12-3-91, Cl. D14-129.000.
Zimmermann, Anso, to Rotpunkt Dr. Anso Zimmermann. Insulated jug. 322,006, 12-3-91, Cl. D7-317.000.
Zoghopoulos, Zissis S. Hoop roller. 322,107, 12-3-91, Cl. D21-210.000.

LIST OF PLANT PATENTEES

Associated Fruit Company: *See*—
Lowry, David B., 7,730, Cl. 36.000.

Bak, Elly: *See*—
Bak, Gerardus J.; Steur, Nicolaas D.; and Bak, Elly, 7,735, Cl. 88.000.

Bak, Gerardus J.; Steur, Nicolaas D.; and Bak, Elly, to Corn. Bak B.V. Guzmania plant named Morado. 7,735, 12-3-91, Cl. 88.000.

Corn. Bak B.V.: *See*—
Bak, Gerardus J.; Steur, Nicolaas D.; and Bak, Elly, 7,735, Cl. 88.000.

Davidson, Harvey D. Rose plant: 'Smooth Perfume'. 7,728, 12-3-91, Cl. 11.000.

Davidson, Harvey D. Rose plant: 'Smooth Melody'. 7,729, 12-3-91, Cl. 22.000.

Deroose, Reginald. *Ficus benjamina* plant named Reginald. 7,736, 12-3-91, Cl. 88.000.

Flemer, William, III, to Rutgers University. Robinia 'Purple Crown'. 7,731, 12-3-91, Cl. 51.000.

Gross, Bruno. Poinsettia named Grostar. 7,734, 12-3-91, Cl. 86.000.

Gross, Eduard. Poinsettia named Grojibi. 7,733, 12-3-91, Cl. 86.000.

Lowry, David B., to Associated Fruit Company. "Royal Forelle" pear tree. 7,730, 12-3-91, Cl. 36.000.

Orton, Elwin R., Jr., to Rutgers University. Dogwood tree- 'Rutlan'. 7,732, 12-3-91, Cl. 51.000.

Rutgers University: *See*—
Flemer, William, III, 7,731, Cl. 51.000.
Orton, Elwin R., Jr., 7,732, Cl. 51.000.

Steur, Nicolaas D.: *See*—
Bak, Gerardus J.; Steur, Nicolaas D.; and Bak, Elly, 7,735, Cl. 88.000.

LIST OF STATUTORY INVENTION REGISTRATIONS

APPLICANTS TO WHOM

STATUTORY INVENTION REGISTRATIONS WERE ISSUED ON THE 3RD DAY OF DECEMBER, 1991

Anzai, Hisao: *See*—
Sasaki, Isao; Nishida, Kozi; and Anzai, Hisao, H1004, Cl. 525-132.000.

Gerharz, Reinhold. Pest dislodgement by electromagnetic fields. H998, 12-3-91, Cl. 43-124.000.

Gerlach, Karl, to United States of America, America. Gram-Schmidt space-time adaptive filter using transverse orthonormal ladder filters. H1005, 12-3-91, Cl. 342-378.000.

Hada, Gentaro: *See*—
Ishiwata, Masao; Kawame, Norio; Sakurai, Takeshi; Nakano, Mieji; Tamazawa, Kazuhide; Kimura, Nobuyuki; Saito, Toshio; and Hada, Gentaro, H1003, Cl. 430-502.000.

Hahn, Harold T. Microwave absorbing material. H1002, 12-3-91, Cl. 428-408.000.

Ishiwata, Masao; Kawame, Norio; Sakurai, Takeshi; Nakano, Mieji; Tamazawa, Kazuhide; Kimura, Nobuyuki; Saito, Toshio; and Hada, Gentaro. Process for producing photographic materials. H1003, 12-3-91, Cl. 430-502.000.

Kawame, Norio: *See*—
Ishiwata, Masao; Kawame, Norio; Sakurai, Takeshi; Nakano, Mieji; Tamazawa, Kazuhide; Kimura, Nobuyuki; Saito, Toshio; and Hada, Gentaro, H1003, Cl. 430-502.000.

Kimura, Nobuyuki: *See*—
Ishiwata, Masao; Kawame, Norio; Sakurai, Takeshi; Nakano, Mieji; Tamazawa, Kazuhide; Kimura, Nobuyuki; Saito, Toshio; and Hada, Gentaro, H1003, Cl. 430-502.000.

M-I Drilling Fluids Company: *See*—
Patel, Arvind D.; and McGlothlin, Raymond E., H1000, Cl. 507-103.000.

McGlothlin, Raymond E.: *See*—
Patel, Arvind D.; and McGlothlin, Raymond E., H1000, Cl. 507-103.000.

Merkel, Harold S.; and Task, Harry L., to United States of America, Air Force. Transparency distortion measurement process. H999, 12-3-91, Cl. 356-239.000.

Mitsubishi Rayon Company Limited: *See*—
Sasaki, Isao; Nishida, Kozi; and Anzai, Hisao, H1004, Cl. 525-132.000.

Nakano, Mieji: *See*—
Ishiwata, Masao; Kawame, Norio; Sakurai, Takeshi; Nakano, Mieji; Tamazawa, Kazuhide; Kimura, Nobuyuki; Saito, Toshio; and Hada, Gentaro, H1003, Cl. 430-502.000.

Nishida, Kozi: *See*—
Sasaki, Isao; Nishida, Kozi; and Anzai, Hisao, H1004, Cl. 525-132.000.

Patel, Arvind D.; and McGlothlin, Raymond E., to M-I Drilling Fluids Company. Water based synthetic hydrocarbon drilling fluid and spotting fluid. H1000, 12-3-91, Cl. 507-103.000.

Saito, Toshio: *See*—
Ishiwata, Masao; Kawame, Norio; Sakurai, Takeshi; Nakano, Mieji; Tamazawa, Kazuhide; Kimura, Nobuyuki; Saito, Toshio; and Hada, Gentaro, H1003, Cl. 430-502.000.

Sakurai, Takeshi: *See*—
Ishiwata, Masao; Kawame, Norio; Sakurai, Takeshi; Nakano, Mieji; Tamazawa, Kazuhide; Kimura, Nobuyuki; Saito, Toshio; and Hada, Gentaro, H1003, Cl. 430-502.000.

Sasaki, Isao; Nishida, Kozi; and Anzai, Hisao, to Mitsubishi Rayon Company Limited. Thermoplastic resin composition. H1004, 12-3-91, Cl. 525-132.000.

Tamazawa, Kazuhide: *See*—
Ishiwata, Masao; Kawame, Norio; Sakurai, Takeshi; Nakano, Mieji; Tamazawa, Kazuhide; Kimura, Nobuyuki; Saito, Toshio; and Hada, Gentaro, H1003, Cl. 430-502.000.

Task, Harry L.: *See*—
Merkel, Harold S.; and Task, Harry L., H999, Cl. 356-239.000.

Thackara, John I., to United States of America, Army. Method of transferring an optical quality film. H1001, 12-3-91, Cl. 427-124.000.

United States of America
Air Force: *See*—
Merkel, Harold S.; and Task, Harry L., H999, Cl. 356-239.000.
Zwicke, Phillip E., H1006, Cl. 364-551.010.
America: *See*—
Gerlach, Karl, H1005, Cl. 342-378.000.
Army: *See*—
Thackara, John I., H1001, Cl. 427-124.000.

Zwicke, Phillip E., to United States of America, Air Force. Multilevel classifier structure for gas turbine engines. H1006, 12-3-91, Cl. 364-551.010.

CLASSIFICATION OF PATENTS

ISSUED DECEMBER 3, 1991

NOTE.—First number, class; second number, subclass; third number, patent number

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335	5,069,069
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495	5,069,716

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CLASS 84

280	5,069,102
327	5,069,103
478	5,069,104
605	5,069,105
626	5,069,106
659	5,069,107

CLASS 86

20.15	5,069,108

CLASS 89

1.11	5,069,109
198	5,069,110

CLASS 91

516	5,069,111

CLASS 98

69	5,069,112

CLASS 99

330	5,069,116
419	5,069,117
453	5,069,118
499	5,069,119

CLASS 100

93 P	5,069,120
137	5,069,121

CLASS 101

9	5,069,122
93.21	5,069,123
142	5,069,124
152	5,069,125
230	5,069,126
415.1	5,069,127
425	5,069,128

CLASS 102

200	5,069,129
202	5,069,130
275.6	5,069,131
331	5,069,132
332	5,069,133
368	5,069,134
380	5,069,135
425	5,069,136
434	5,069,137
518	5,069,138
	5,069,139

CLASS 104

28	5,069,140

CLASS 105

30	5,069,141

CLASS 106

2	Re.33,759
18.35	5,069,717
22	5,069,718
	5,069,719
285	Re.33,760
287.35	5,069,720
724	5,069,721

CLASS 108

42	5,069,142
51.1	5,069,143
129	5,069,144

CLASS 110

244	5,069,145
281	5,069,146
349	5,069,147

CLASS 112

104	5,069,148
241	5,069,150
277	5,069,149
278	5,069,151
313	5,069,152

CLASS 114

39.2	5,069,153
211	5,069,154

CLASS 118

52	5,069,155
	5,069,156
314	5,069,157
410	5,069,158

CLASS 119

14.08	5,069,160
14.1	5,069,159
14.47	5,069,161
	5,069,162
27	5,069,163
53	5,069,164
57.6	5,069,165
61	5,069,166
	5,069,167
96	5,069,168

CLASS 122

4 D	5,069,170
	5,069,171
33	5,069,169
382	5,069,172

CLASS 123

90.61	5,069,173
179.16	5,069,174
193 H	5,069,175
	5,069,176
196 S	5,069,177
256	5,069,178
270	5,069,179
376	5,069,180
399	5,069,181
418	5,069,182
419	5,069,183
422	5,069,184
435	5,069,185
470	5,069,186
520	5,069,188
533	5,069,189
538	5,069,190
	5,069,191
572	5,069,192
602	5,069,193
612	5,069,194

CLASS 124

155	5,070,125

CLASS 125

23.01	5,069,195

CLASS 126

25 R	5,069,196
299 E	5,069,197
369	5,069,198
400	5,069,199
512	5,069,200

CLASS 128

79	5,069,201
80 H	5,069,202
87 R	5,069,203
200.23	5,069,204
201.24	5,069,205
207.17	5,069,206
366	5,069,207
403	5,069,208
419 P	5,069,209
420.6	5,069,210
421	5,069,211
615	5,069,212
633	5,069,213
	5,069,214
642	5,069,215
653.4	5,069,216
657	5,069,217
670	5,069,218
679	5,069,219
719	5,069,220
721	5,069,221
724	5,069,222
734	5,069,223
752	5,069,224
765	5,069,225
772	5,069,226
844	5,069,227
	5,069,228
877	5,069,229

CLASS 131

330	5,069,230
335	5,069,231

CLASS 132

320	5,069,232
322	5,069,233

CLASS 134

22.11	5,069,722
25.1	5,069,723
37	5,069,724
42	5,069,725
113	5,069,234
	5,069,235
153	5,069,236

CLASS 135

19.5	5,069,237
109	5,069,238

CLASS 136

201	5,069,726
251	5,069,727

CLASS 137

15	5,069,239
	5,069,240
119	5,069,241
155	5,069,242
205	5,069,243
209	5,069,244
218	5,069,245
219	5,069,246
558	5,069,247
613	5,069,248
625.23	5,069,250
625.25	5,069,251
625.4	5,069,249

CLASS 138

44	5,069,252
109	5,069,253
111	5,069,254
149	5,069,255

CLASS 139

83	5,069,256
99	5,069,257

CLASS 141

1.1	5,069,258
98	5,069,259
292	5,069,260

CLASS 148

16	5,069,728
23	5,069,730
305	5,069,731

CLASS 150

150	5,069,261

CLASS 152

536	5,069,262

CLASS 156

67	5,069,733
71	5,069,732
84	5,069,734
94	5,069,736
210	5,069,737
444	5,069,738
468	5,069,739
497	5,069,735
616.2	5,069,740
617.1	5,069,741
620.7	5,069,742
	5,069,743
623 R	5,069,744
630	5,069,745

633 5,069,746
643 5,069,747
5,069,748
646 5,069,749

CLASS 159

2.001 5,069,750

CLASS 160

135 5,069,263
178.1 5,069,264

CLASS 162

5 5,069,751
37 5,069,752
49 5,069,753
168.2 5,069,754

CLASS 164

35 5,069,265
112 5,069,266
155 5,069,267
158 5,069,268
325 5,069,269
481 5,069,270
516 5,069,271

CLASS 165

8 5,069,272
12 5,069,273
32 5,069,274
67 5,069,275
166 5,069,276
173 5,069,277

CLASS 166

68 5,069,278
234 5,069,279
278 5,069,280
295 5,069,281
301 5,069,282
308 5,069,283
311 5,069,284
5,069,285
312 5,069,286
339 5,069,287
348 5,069,288

CLASS 168

4 5,069,289

CLASS 169

45 5,069,290
66 5,069,291

CLASS 171

1 5,069,292

CLASS 172

22 5,069,293
49.5 5,069,294
123 5,069,295
825 5,069,296

CLASS 173

492 5,069,187

CLASS 174

35 GC 5,070,216

CLASS 175

65 5,069,297
107 5,069,298
329 Re.33,757

CLASS 177

25.15 5,069,299
25.18 5,069,300

CLASS 178

19 5,070,217

CLASS 180

143 5,069,301
197 5,069,302
219 5,069,303
221 5,069,304
249 5,069,305
291 5,069,306

CLASS 181

105 5,069,307
106 5,069,308
268 B1 4,574,914

CLASS 182

119 5,069,309
187 5,069,310

CLASS 188

32 5,069,311
52 5,069,312
72.3 5,069,313
73.36 5,069,314
79.55 5,069,315
79.62 5,069,316
286 5,069,317
377 5,069,318

CLASS 192

0.052 5,069,319
56 R 5,069,320
70.17 5,069,321
70.25 5,069,322
110 B 5,069,323

CLASS 194

212 5,069,324
235 5,069,325

CLASS 198

619 5,069,326
725 5,069,327
731 5,069,328
752 5,069,329
778 5,069,330
848 5,069,331

CLASS 200

5 A 5,070,218
43.008 5,070,219
81.9 M 5,070,220
284 5,070,221

CLASS 202

169 5,069,755

CLASS 203

51 5,069,756
5,069,757

CLASS 204

60 5,069,764
173 5,069,765
180.1 5,069,766
5,069,768
181.7 5,069,767
182.8 5,069,769
192.12 5,069,770
292 5,069,771
298.12 5,069,772
299 R 5,069,773
404 5,069,774

CLASS 205

73 5,069,758
5,069,759
80 5,069,760
137 5,069,762
183 5,069,761
326 5,069,763

CLASS 206

6.1 5,069,332
39.5 5,069,333
45.34 5,069,334
144 5,069,335
219 5,069,336
306 5,069,337
319 5,069,338
340 5,069,339
347 5,069,340
365 5,069,341
372 5,069,342
508 5,069,343
5,069,344

CLASS 208

108 5,069,775
120 5,069,776
207 5,069,777

CLASS 209

323 5,069,778
700 5,069,346

CLASS 210

87 5,069,779
90 5,069,780
164 5,069,781
192 5,069,782
196 5,069,783
205 5,069,784
232 5,069,785
5,069,786
259 5,069,787
321.8 5,069,788
321.84 5,069,789
323.1 5,069,790
344 5,069,791
627 5,069,792
640 5,069,793
650 5,069,794
652 5,069,795
664 5,069,796
690 5,069,797
700 5,069,798
749 5,069,799
757 5,069,800
770 5,069,801

CLASS 211

4 5,069,347
24 5,069,348
59.3 5,069,349
87 5,069,350

CLASS 215

11.1 5,069,351

CLASS 219

10.493 5,070,222
10.55 M 5,070,223
69.12 5,070,224
73 5,070,225
98 5,070,226
121.46 5,070,228
121.55 5,070,227
203 5,070,229
5,070,230
216 5,070,231
390 5,070,232

CLASS 220

1.5 5,069,352
4.01 5,069,353
4.22 5,069,354
270 5,069,345
5,069,355
276 5,069,356
307 5,069,357
426 5,069,358
441 5,069,359
500 B1 4,606,472
501 5,069,360

CLASS 221

82 5,069,361
131 5,069,362

CLASS 222

95 5,069,363
5,069,364
105 5,069,365
152 5,069,366
153 5,069,367
321 5,069,368
5,069,369
464 5,069,370
509 5,069,371
541 5,069,372

CLASS 223

85 5,069,373
111 5,069,374

CLASS 224

273 5,069,375
277 5,069,376
326 5,069,377

CLASS 225

1 5,069,378

CLASS 227

131 5,069,379

CLASS 228

42 5,069,380
132 5,069,381
146 5,069,382
157 5,069,383

CLASS 229

69 5,069,384
137 5,069,385

CLASS 235

380 5,070,233
441 5,070,234

CLASS 238

349 5,069,386

CLASS 239

18 5,069,387
145 5,069,388
289 5,069,389
320 5,069,390
332 5,069,391
675 5,069,392

CLASS 241

46.17 5,069,393

CLASS 242

47.01 5,069,395
67.1 R 5,069,394
321 5,069,396

CLASS 244

1 R 5,069,397
3.12 5,069,398
14 5,069,399
118.100 5,069,400
118.5 5,069,401
130 5,069,402
5,069,403
145 5,069,404

CLASS 248

98 5,069,405
156 5,069,406
221.3 5,069,407
250 5,069,408
451 5,069,409
475.1 5,069,410
476 5,069,411
493 5,069,412
638 5,069,413
5,069,414
674 5,069,415
902 5,069,416

CLASS 249

74 5,069,417
210 5,069,418

CLASS 250

201.1 5,070,235
208.1 5,070,236
227.31 5,070,237
231.13 5,070,238
252.1 5,070,239
288 5,070,240
336.2 5,070,241
339 5,070,242
341 5,070,243
343 5,070,244
5,070,245
373 5,070,246
472.1 5,070,247
483.1 5,070,248
5,070,249
548 5,070,250

CLASS 251

11 5,069,419
30.02 5,069,420
99 5,069,421
129.1 5,069,422
144 5,069,423
149.6 5,069,424
359 5,069,425

CLASS 252

8.554 5,069,802
26 5,069,803
42.7 5,069,804
47.5 5,069,805
52 A 5,069,806
62.54 5,069,807
99 5,069,808
174.12 5,069,809
5,069,810
174.14 5,069,811
186.44 5,069,812
299.01 5,069,813
299.67 5,069,814
301.36 5,069,815
315.5 5,069,816
351 5,069,817
402 5,069,819
500 5,069,820
5,069,821
511 5,069,822
518 5,069,823
5,069,824
533 5,069,825
587 5,069,826
626 5,069,827

CLASS 254

29 R 5,069,426

CLASS 260

402 5,069,828
428 5,069,829

CLASS 261

94 5,069,830

CLASS 264

4.33 5,069,831
23 5,069,832
5,069,833
24 5,069,834
26 5,069,835
36 5,069,836
45.2 5,069,837
46.6 5,069,838
63 5,069,839
69 5,069,840
86 5,069,841
101 5,069,842
103 5,069,843
5,069,844
5,069,845
5,069,846
5,069,847
118 5,069,848
148 5,069,849
167 5,069,850
171 5,069,851
5,069,852
176.1 5,069,853
205 5,069,854
235 5,069,855
519 5,069,856
544 5,069,857
572 5,069,858
5,069,859

CLASS 266

104 5,069,427
5,069,428
143 5,069,429
271 5,069,430

CLASS 267

141 5,069,431

CLASS 269

3 5,069,432
277 5,069,433

CLASS 271

2 5,069,434
3 5,069,435
3.1 5,069,436
5,069,437
10 5,069,438
163 5,069,439
202 5,069,440
250 5,069,442

CLASS 272

56.5 R 5,069,443
70 5,069,444
96 5,069,445
5,069,446
123 5,069,447
130 5,069,448
139 5,069,449

CLASS 273

1.5 A 5,069,441
25 5,069,450
57.2 5,069,451
73 J 5,069,452
139 5,069,453
165 5,069,454
176 H 5,069,455
183 E 5,069,456
189 R 5,069,457
238 5,069,458
241 5,069,459
355 5,069,460

CLASS 277

25 5,069,461

CLASS 280

14.2 5,069,463
23 5,069,462
47.35 5,069,464
47.371 5,069,465
79.3 5,069,466
276 5,069,467
278 5,069,468
288.1 5,069,469
288.4 5,069,470
414.1 5,069,471
433 5,069,472
605 5,069,473
658 5,069,474
707 5,069,475
5,069,476
732 5,069,477
733 5,069,478
734 5,069,479
743 5,069,480
769 5,069,481
801 5,069,482
5,069,483

CLASS 285

39 5,069,484
55 5,069,485
166 5,069,486
226 5,069,487
302 5,069,488
319 5,069,489
337 5,069,490

CLASS 292

48 5,069,491
85 5,069,492
216 Re.33,758
336.3 5,069,493

CLASS 294

1.2 5,069,494
15 5,069,495

CLASS 296

155 5,069,497
180.1 5,069,498
201 5,069,499
214 5,069,500
223 5,069,501
5,069,502

CLASS 297

54 5,069,503
184 5,069,504
216 5,069,505
300 5,069,496
440 5,069,506

CLASS 298

11 5,069,507

CLASS 303

113 TR 5,069,508

CLASS 305

58 PC 5,069,509
5,069,510

CLASS 307

46 5,070,251
64 5,070,252
75 5,070,253
261 5,070,254
268 5,070,255
270 5,070,256
296.3 5,070,257
303 5,070,258
350 5,070,259
475 5,070,261
5,070,262

CLASS 310

22 5,070,263
68 B 5,070,264
71 5,070,265
77 5,070,266
89 5,070,267
153 5,070,268
171 5,070,269
239 5,070,270
313 R 5,070,271

CLASS 312

107.5 5,069,511
139.2 5,069,512
201 5,069,513
348.3 5,069,514

CLASS 313

386 5,070,272
607 5,070,273

CLASS 315

111.21 5,070,274
111.81 5,070,275
209 R 5,070,276
248 5,070,277
5,070,278
289 5,070,279
368.11 5,070,280
370 5,070,281
383 5,070,282

CLASS 318

139 5,070,283
362 5,070,284
461 5,070,285
568.1 5,070,286
569 5,070,287
618 5,070,288
640 5,070,289
758 5,070,290
771 5,070,291
811 5,070,292

CLASS 320

2 5,070,293

CLASS 323

267 5,070,294
314 5,070,295

CLASS 324

73.1 5,070,296
158 P 5,070,297
207.20 5,070,298
309 5,070,299
464 5,070,300
509 5,070,301
662 5,070,302

CLASS 328

145 5,070,303

CLASS 330

54 5,070,304
69 5,070,305
253 5,070,306
5,070,307
268 5,070,308
298 5,070,309

CLASS 331

1 A 5,070,310
111 5,070,311

CLASS 332

109 5,070,312

CLASS 333

202 5,070,313
260 5,070,314

CLASS 335

128 5,070,315
172 5,070,361

215 5,070,316

CLASS 336

200 5,070,317

CLASS 338

34 5,070,318

CLASS 340

384 E 5,070,319
539 5,070,320
608 5,070,321
653 5,070,322
705 5,070,323
706 5,070,324
5,070,325
719 5,070,326
815.14 5,070,327
825.44 5,070,329
825.54 5,070,328

CLASS 341

26 5,070,330
154 5,070,331
156 5,070,332
157 5,070,333

CLASS 342

43 5,070,334
90 5,070,335
151 5,070,336
201 5,070,337
355 5,070,338

CLASS 343

700 MS 5,070,339
767 5,070,340

CLASS 346

1.1 5,070,341
5,070,344
5,070,345
76 PH 5,070,342
5,070,343
140 R 5,070,346
5,070,347

CLASS 350

96.1 5,069,516
631 5,069,540

CLASS 351

86 5,069,541
160 H 5,069,542

CLASS 353

482 5,070,415

CLASS 354

64 5,070,348
152 5,070,349
195.1 5,070,350
299 5,070,351
402 5,070,352
5,070,353
412 5,070,354
413 5,070,355
439 5,070,356
468 5,070,357

CLASS 355

20 5,070,358
27 5,070,359
40 5,070,360
206 5,070,362
5,070,363
211 5,070,364
212 5,070,365
219 5,070,366
246 5,070,368
271 5,070,369
5,070,370
272 5,070,371
5,070,372
290 5,070,373
326 5,070,367
5,070,374

CLASS 356

4 5,069,543
28.5 5,069,545
73.1 5,069,544
316 5,069,546
374 5,069,547
376 5,069,548
5,069,549
383 5,069,550
432 5,069,551
440 5,069,552

CLASS 357

4 5,070,375
22 5,070,376
23.4 5,070,377
23.5 5,070,378
23.7 5,070,379
24 5,070,380
35 5,070,381
48 5,070,382
51 5,070,383
5,070,384
5,070,385
52 5,070,386
60 5,070,387
68 5,070,388
5,070,389
70 5,070,390
71 5,070,391
5,070,392
80 5,070,393

CLASS 358

11 5,070,394
5,070,395
12 5,070,396
22 5,070,397
37 5,070,398
81 5,070,399
84 5,070,400
107 5,070,401
135 5,070,402
136 5,070,403
142 5,070,404
209 5,070,405
224 5,070,406
225 5,070,407
227 5,070,408
241 5,070,409
296 5,070,410
302 5,070,411
451 5,070,412
456 5,070,413
466 5,070,414

CLASS 359

54 5,069,534
55 5,069,531
56 5,069,532
76 5,069,533
200 5,069,515
233 5,069,528
273 5,069,535
330 5,070,260
498 5,069,530
514 5,069,539
557 5,069,537
601 5,069,529
689 5,069,536
823 5,069,527
871 5,069,538

CLASS 360

44.12 5,070,488
66 5,070,416
71 5,070,417
5,070,418
72.2 5,070,419
75 5,070,420
77.07 5,070,421
85 5,070,422
106 5,070,423
108 5,070,424
135 5,070,425

CLASS 361

91 5,070,426
104 5,070,427
341 5,070,428
358 5,070,429
407 5,070,430
415 5,070,529

CLASS 362

31 5,070,431
61 5,070,432
66 5,070,433
74 5,070,434
101 5,070,435
108 5,070,436
158 5,070,437
206 5,070,438

CLASS 363

22 5,070,439
71 5,070,440
154 5,070,441

CLASS 364

146 5,070,442
401 5,070,452
402 5,070,453
413.13 5,070,454
413.19 5,070,455
419 5,070,456
5,070,478
420 5,070,457
424.06 5,070,458
426.02 5,070,459
5,070,460
426.03 5,070,461
460 5,070,462
464.02 5,070,463
474.34 5,070,464
550 5,070,468
578 5,070,469
705.08 5,070,470
760 5,070,471
821 5,070,472

CLASS 365

49 5,070,480
228 5,070,481
230.06 5,070,482

CLASS 367

14 5,070,483
124 5,070,484
127 5,070,485
155 5,070,486

CLASS 369

13 5,070,487
44.16 5,070,489
44.26 5,070,490
44.34 5,070,491
47 5,070,492
112 5,070,493
5,070,494
116 5,070,495
5,070,496

CLASS 370

14.0 5,070,497
60 5,070,498
61 5,070,499
69.1 5,070,500
85.4 5,070,501

CLASS 371

11.1 5,070,502
37.1 5,070,503
54 5,070,504

CLASS 372

22 5,070,505
40 5,070,506
41 5,070,507
44 5,070,508
45 5,070,509
46 5,070,510
50 5,070,511
65 5,070,512
83 5,070,513

CLASS 374

140 5,069,553

CLASS 375

14 5,070,514
27 5,070,515
102 5,070,516
117 5,070,517

CLASS 376

235 5,069,860
260 5,069,861
5,069,862
270 5,069,863
441 5,069,864
451 5,069,865

CLASS 377

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CLASS 378

146 5,070,519
196 5,070,520

CLASS 379

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90 5,070,522
94 5,070,523
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CLASS 380

48 5,070,528

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201 5,070,530

CLASS 382

49 5,070,531
56 5,070,532

CLASS 383

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CLASS 384

43 5,069,555
115 5,069,558
277 5,069,559
486 5,069,560

CLASS 385

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14 5,069,561
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32 5,069,519
39 5,069,522
43 5,069,518
59 5,069,524
100 5,069,525
101 5,069,526
130 5,069,517
135 5,069,523

CLASS 392

301 5,070,533

CLASS 395

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143 5,070,466
155 5,070,534
166 5,070,467
325 5,070,449
5,070,477
375 5,070,451
5,070,475
425 5,070,444
500 5,070,445
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5,070,474
575 5,070,448
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750 5,070,450

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120 5,069,557
5,069,562
208 5,069,563
605 5,069,564
616 5,069,565
656 5,069,566

CLASS 402

3 5,069,567
73 5,069,568

CLASS 403

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191 5,069,580
259.6 5,069,581

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182 5,069,583

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241 R 5,069,585

CLASS 411

339 5,069,586
432 5,069,587
439 5,069,588
533 5,069,589

CLASS 413

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CLASS 414

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240 5,069,592
408 5,069,593
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462 5,069,595
607 5,069,596
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790 5,069,598

CLASS 415

182.1 5,069,599

CLASS 417

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360 5,069,601
399 5,069,602
423.4 5,069,603

CLASS 418

36 5,069,604
55.2 5,069,605
58 5,069,606
63 5,069,607
261 5,069,608

CLASS 419

6 5,069,866
15 5,069,867
23 5,069,868
28 5,069,869

CLASS 420

70 5,069,870
72 5,069,871
436 5,069,872
448 5,069,873
478 5,069,874
548 5,069,875

CLASS 421

449 5,069,908

CLASS 422

4 5,069,876
5,069,877
61 5,069,878
86 5,069,879
135 5,069,881
150 5,069,882
186 5,069,885
186.19 5,069,880
269 5,069,883

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181 5,069,884
237 5,069,886
240 V 5,069,887
260 5,069,888
306 5,069,889
328 5,069,890
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445 5,069,892
556 5,069,893
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89 5,069,901
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90 5,069,611
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150 5,069,613
525 5,069,614
556 5,069,615

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93 5,069,915
234 5,069,920
243 5,069,916
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597 5,069,925

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115 5,069,995
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280 5,070,022

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546 5,070,025

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22 5,070,028
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51 5,069,665
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PATENTS

01 : 5,069,346
5,069,695
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5,069,318
5,069,388
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DESIGN PATENTS

01 :	322,107		322,083		322,113		322,112		321,993		322,046
05 :	321,983	10 :	322,058		322,114	30 :	322,020		322,117		322,052
06 :	321,987	12 :	321,979	25 :	322,042	31 :	322,097		322,123		322,115
	321,988		322,014		322,071	33 :	321,998	39 :	321,970		322,144
	322,000		322,089		322,079		322,116		321,995	45 :	322,016
	322,029		322,104		322,121	34 :	321,991		322,001	47 :	322,045
	322,041	13 :	321,984		322,135		322,002		322,004	48 :	321,971
	322,043	15 :	322,130	26 :	321,990	36 :	321,968		322,032		322,024
	322,059	17 :	322,017		321,994		321,986		322,033		322,070
	322,063		322,018		322,009		322,015		322,101		322,075
	322,066		322,019		322,010		322,030		322,143		322,085
	322,081		322,040		322,022		322,044	40 :	322,011		322,147
	322,124		322,140		322,023		322,056	41 :	321,973	51 :	322,125
	322,127	20 :	322,077		322,131		322,069		321,974	53 :	321,989
	322,128	22 :	322,096		322,132		322,080		321,977		322,074
	322,146	23 :	322,105		322,133		322,087		321,978		322,078
08 :	321,997	24 :	322,108		322,134		322,106		322,099		322,090
	322,055		322,109	27 :	322,118	37 :	321,985	42 :	321,980	55 :	322,003
	322,100		322,110	29 :	321,969		321,992		322,025		322,122
09 :	322,007		322,111								

PLANT PATENTS

06 :	7,728		7,729	34 :	7,731		7,732	41 :	7,730		

STATUTORY INVENTION REGISTRATIONS

06 :	H1001										
	H1002		H1006	24 :	H998		H1005	39 :	H999	48 :	H1000

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